

Juyang (John) Weng

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Updated: May 19, 2022

Citizenship: U.S.

Education

Ph.D. in Computer Science, University of Illinois at Urbana-Champaign, Jan. 1989. Co-Advisors: Thomas S. Huang (member of the National Academy of Engineering, NAE) and Narendra Ahuja.

M.S. in Computer Science, University of Illinois at Urbana-Champaign, May, 1985. Advisor: Narendra Ahuja.

B.S. in Computer Science, Fudan University, Jan. 1982

Professional Experience

Professor (7/2003 – 5/15/2021), *Associate Professor*, (7/1998 – 6/2003) *Assistant Professor* (8/1992 – 6/1998), Department of Computer Science and Engineering, Michigan State University, East Lansing, Michigan, USA

Founder and President, GENISAMA LLC, Okemos, Michigan, USA

Visiting Professor (3/2004 - 3/2014), Fudan University, Shanghai, China

Visiting Professor (8/2006 - 5/2007) The Department of Brain and Cognitive Sciences, Massachusetts Institute of Technology, Cambridge, MA USA. Host: Prof. Mriganka Sur

Visiting Associate Professor (8/1999 - 5/2000), The Media Laboratory, Massachusetts Institute of Technology, Cambridge, MA USA. Host: Prof. Alex Pentland

Visiting Assistant Research Professor (10/1990 – 8/1992), Beckman Institute, University of Illinois, Urbana, IL USA

Researcher (1/1989 – 9/1990), Computer Science Research Institute of Montreal (CRIM), Montreal, Canada and Ecole Polytechnique, University of Montreal, Montreal, Canada

Research assistant (8/1984 – 12/1988), Coordinate Science Laboratory, University of Illinois, Urbana, IL USA

Research Interests

VISI chips and hardware for machine vision. Weng believes vision alone is ineffective for autonomous systems in cluttered scenes, e.g., during autonomous driving. Vision requires contexts from “higher and larger contexts” and other modalities. Therefore, Weng is also interested in audition, touch, cognition, behaviors, natural languages, planning, and motivation. Better, they are all learned in real time. The work of Cresceptron (IJCNN 1992, ICCV

1993, and IJCV 1997), by Weng, Ahuja and Huang, was the first deep learning network for natural 3D scenes. It invented the max-pooling technique now widely used in deep learning. Since J. Weng, J. McClelland, A. Pentland, O. Sporns, I. Stockman, M. Sur and E. Thelen, “Autonomous Mental Development for Robots and Animals”, a policy forum piece in Science 2001, Weng has been interested in developmental learning. He and his students have developed Developmental Networks (DNs), with their embodiments Where-What Networks (WWN-1) to WWN-9, for general-purpose visual learning in cluttered worlds. Going beyond Cresceptron, a DN not only learns to recognize objects, but also learns where to look and what to look, based on self-generated context within the current task and beyond. By context, we mean any vector representations that can be expressed by the learner’s motor areas: actions, contexts, goals, purposes, intents, and so on. However, so far the DN has experimented with only earlier contexts that typically a child has learned, such as locations, types, targets, costs, good, bad, distances, choices, and simple plans. The DN has also developed natural language contexts from text inputs, but Dr. Weng’s group has not yet used these natural language contexts as top-down context for vision other than word labels. This is one of their current goals in the future projects toward general-purpose vision for autonomous driving. As a theoretical basis, Dr. Weng has mathematically proved that a DN can learn any Turing Machines, including Universal Turing Machines. However, they are Emergent Turing Machines with general-purpose sensing and reasoning for cluttered scenes. By emergent, we mean unsupervised patterns (images, actions, internal firings) that naturally emerge from the natural world activities in real time, so as to replace human handcrafted symbols. Dr. Weng’s research has been supported by NSF, DARPA, ONR, Siemens Corporate Research, Microsoft Research, SAIC, Zyvex, AVS, GM, and Toyota.

Multidisciplinary Background

Dr. Weng is a faculty member of MSU Cognitive Science Program and MSU Neuroscience Program. Since 1991, he has been studying psychology and neuroscience, working with psychologists and neuroscientists. He spent the 2006-2007 academic year on sabbatical at the Department of Brain and Cognitive Sciences at MIT, hosted by neuroscientist Prof. Mriganka Sur. In Spring 2007, he taught a graduate course titled *Computational Cognitive and Neural Development*, crossed listed as BCS9.915 and EECS6.887 at MIT. Dr. Weng has also taught BMI 831, Cognitive Science.

Technology transfer

Founder, GENISAMA LLC, registered Nov. 30, 2015. The major goal of the startup is to provide online, real time, wearable learning systems for vision, audition, and natural languages, based on mobile phones.
<http://www.genisama.com>

Professional Activities, Service and Awards

- *IEEE Fellow* since January 2009
- *Journal Founder and Editor-in-Chief*:
 - *International Journal of Humanoid Robotics*, available as print and online, World Scientific Publishing, with Ming Xie and Giulio Sandini, 2003 – present.
 - *Brain-Mind Magazine*, <http://www.brain-mind-magazine.org/>, available online, 2012 - present.
- *Book Series Editor*: New Frontiers in Robotics, with Ming Xie, 5/17/2021 - present.
- *Founder and President*:

- Brain-Mind Institute, East Lansing, MI, a nonprofit startup, 2012 - present.
<http://www.brain-mind-institute.org/>
- *Founder and Chairman:*
 - Autonomous Mental Development Technical Committee, IEEE Computational Intelligence Society, Feb. 2004 – Feb. 2006.
- *Founder and Production Supervision:*
 - *AMD Newsletter*, published by the IEEE CIS AMD Technical Committee, 2004 - present.
<http://www.cse.msu.edu/amdtc/amdn/>
- *Chairman:*
 - Education Committee, International Neural Network Society (INNS); 2010.
 - Governing Board of International Conferences on Development and Learning, Feb. 2005 - Feb. 2008.
 - Finance Committee, the International Neural Network Society, August 2007 - Dec. 2008.
- *Board Member:* Executive Board of the International Neural Network Society, Feb. 2006 - Dec. 2008.
- *Associate Editor:*
 - IEEE Transactions on Autonomous Mental Development, 2008 – present. Recently changed to IEEE Transactions on Cognitive and Developmental Systems.
 - IEEE Transactions on Pattern Analysis and Machine Intelligence, 2001 – 2004.
 - IEEE Transactions on Image Processing, 1994 – 1997.
- *Book Co-Editor:* Asim Roy, Leonid Perlovsky, Tarek R. Besold, Juyang Weng and Jonathan C. W. Edwards (eds.) *Representation in the Brain*, Frontiers Publisher, August, 2018.
- *Guest Editor:*
 - Special Issue on *Special Issue on What AI and Neuroscience Can Learn from Each Other: Open Problems in Models and Theories, Cognitive Computation*, (co-edited with Asim Roy at Arizona State University, Claudius Gros at Goethe University Frankfurt, Jean-Philippe Thivierge at University of Ottawa, Tsvi Achler at Optimizing Mind and Ali Minai at University of Cincinnati). The deadline was May 31, 2022.
 - The Special Issue on Brain Imaging-informed Multimodal Analysis, *IEEE Transactions on Autonomous Mental Development*, (co-edited with Junwei Han of Northwestern Polytechnical University, Tianming Liu of University of Georgia, Christine Cong Guo of QIMR Berghofer, and Deniz Erdogmus of Northeastern University.) The deadline was Oct. 10, 2014, appeared 2015.
 - The Special Issue on Computational Modeling of Neural and Brain Development, *IEEE Transactions on Autonomous Mental Development*, (co-edited with Yaochu Jin of University of Surrey, Yan Meng of Stevens Institute of Technology, and Nik Kasabov of Auckland University of Technology.) The issue appeared Dec. 2011.
 - The Special Issue on Autonomous Mental Development, *IEEE Transactions on Evolutionary Computation*, editorial work 2004-2006 (co-edited with Jay McClelland of Stanford University and Kim Plunkett of Oxford University). The issue appeared April 2007.

- The Special Issue on Autonomous Mental Development, *International journal of Humanoid Robotics*, editorial work 2005-2007 (co-edited with Brian Scassellati of Yale University and Zhengyou Zhang of Microsoft Research, Redmond). The issue appeared in June 2007.
- *General Chair*:
 - AIML Contest, (unique for task-independence and modality-independence), 2016, 2017, 2018, 2019.
 - International Conference on Brain-Mind, Beijing, July 12-13, 2014.
<http://www.brain-mind-institute.org/program-summer-2014.html>
 - Brain-Mind Workshop, Fudan University, Shanghai, China, December 21-22, 2013.
<http://www.brain-mind-workshop.org/programs-2013.html>
 - International Conference on Brain-Mind, East Lansing, July 14-15, 2013.
<http://www.brain-mind-institute.org/program-summer-2013.html>
 - Brain-Mind Workshop, Fudan University, Shanghai, China, December 15 - 16, 2012.
<http://www.brain-mind-workshop.org/programs-2012.html>
 - International Conference on Brain-Mind, East Lansing, July 14-15, 2012.
<http://www.brain-mind-institute.org/program-summer-2012.html>
 - Brain-Mind Workshop, Fudan University, Shanghai, China, December 19 - 20, 2011.
<http://www.brain-mind-workshop.org/programs-2011.html>
 - IEEE 8th International Conference on Development and Learning, Shanghai, China, June 5-7, 2009
<http://jcx.fudan.edu.cn/~icdl2009/>
 - INNS New Directions in Neural Networks Symposia (NNN 2008), Auckland, New Zealand, Nov. 24-25, 2008
 - IEEE 7th International Conference on Development and Learning, Monterey, CA, August 9-12, 2008 (chaired with Jay McClelland of Stanford University)
<http://www.cse.msu.edu/ei/icdl08/>
- *Program Chair*:
 - 2nd International Conference on Development and Learning (ICDL'02), MIT, Cambridge, MA, June 13-15, 2002 (chaired with Jeff Elman of UCSD and Mriganka Sur of MIT)
 - NSF/DARPA Workshop on Development and Learning (WDL), Michigan State University, East Lansing, MI, April 5-7, 2000 (chaired with Ida Stockman of MSU).
- *Competition Chair*: International Joint Conference on Neural Networks, Anchorage, AL, May 14 - 19, 2017.
- *Invited participant*, UK Foresight Program, Cognitive Systems Project, 2003.
- *Member of review panels*, NSF Science of Learning Centers Program 2003 (one of the five panelists in the final panel, Blue-Ribbon panel, of the three rounds of reviews,), NSF review panels of the Robotics and Machine Intelligence Program, the Interactive Systems Program, the SBIR/STTR Program, the Graduate Fellowship Program, the CISE Research Instrumentation Grants Program
- *Member of project review panel*, European Commission, Cognitive Systems, Interaction, Robotics Program, the three-person project review panel of EC FP7 Italk project 2009; European Commission FP7 evaluator panel.
- *Panel Organizer*:

- Panel on “AIML Contests”, International Joint Conference on Neural Networks, Anchorage, AL, May 14 - 19, 2017.
 - Panel on “Brain-Mind Architectures: Module-Free, General Purpose and Immediate Learning”, International Joint Conference on Neural Networks, San Jose, California, July 31 - August 5, 2011 (co-organized with Asim Roy of Arizona State University)
 - Panel on “Between Bottom-Up and Top-Down What Is the Much in-between?” International Joint Conference on Neural Networks, Barcelona, Spain, July 21, 2010 (co-organized with Asim Roy of Arizona State University)
 - Panel on Autonomous Mental Development, International Conference on Development and Learning, June 14, 2002
- *Special Session Organizer:*
 - Special session on Brain-Mind Architectures and Learning Mechanisms, International Joint Conference on Neural Networks, San Jose, California, July 31 - August 5, 2011 (co-organized with Asim Roy of Arizona State University)
 - Special session on Mental Architecture and Representation, International Joint Conference on Neural Networks, Barcelona, Spain, July 20, 2010 (co-organized with Asim Roy of Arizona State University)
 - Special session on Autonomous Mental Development, IEEE/INNS International Joint Conference on Neural Networks, Orlando, Florida, August 12-17, 2007.
 - Special Invited Session on Autonomous Mental Development, World Congress on Computational Intelligence (WCCI 2006), Vancouver, BC Canada, July 16-21, 2006 (co-organized with Brian Scassellati of Yale University)
 - Special Session on Perceptual Processing Systems and Their Development, The 5th International Conference on Development and Learning (ICDL'06), Bloomington, IN, USA, May 31 - June 3, 2006 (co-organized with Zhengyou Zhang of Microsoft Research, Redmond)
 - Special Invited Session on Autonomous Mental Development, International Joint Conference on Neural Networks, Portland Oregon, July 20-24, 2003 (co-organized with Olaf Sprons of Indiana University)
 - Biography listed in *Who's Who in Science and Engineering*, *Who's Who in America*, and *Who's Who in the World*.
 - *International Advisory Committee member:*
 - The Second International Conference of Intelligent Robotics and Applications, Singapore, Dec. 16 - 18, 2009.
 - *Program Committee Member:*
 - International Joint Conference on Neural Networks, Anchorage, AL, May 14 - 19, 2017.
 - The 23rd International Conference on Neural Information Processing, Tokyo, Japan, Oct. 16-21, 2016.
 - The 13th International Symposium on Neural Networks, Saint Petersburg, Russia, July 6-8, 2016.
 - The 9th IFIP International Conference on Intelligent Information Processing, Melbourne, Australia, November 18-21, 2016.
 - The 2013 IEEE Symposium on Artificial Life, Singapore, April 15 - 19, 2013

- IEEE 10th International Conference on Development and Learning, and on Epigenetic Robotics (ICDL-EpiRob), Frankfurt, Germany, August 24-27, 2011.
- International Joint Conference on Neural Networks, San Jose, CA, July 31 - August 4, 2011.
- International Joint Conference on Neural Networks, Barcelona, Spain, July 18-23, 2010.
- International Conference on Computer Vision Theory and Applications, Angers, France, May 17-21, 2010.
- The 2nd International Conference on BioMedical Engineering and Informatics Tianjin, China, Oct. 17-19, 2009.
- IEEE Symposium on Artificial Life (ALife 2009), Nashville, TN, USA, March 30 ?? April 2, 2009.
- International Joint Conference on Neural Networks, Orlando, Florida, USA, August 12 - August 17, 2007. Also a member of the Organizing Committee and the Chair of Special Sessions.
- International Conference on Development and Learning 2007. Also a member of the Organizing Committee.
- IEEE International Conference on Systems, Man, and Cybernetics (SMC 2006), Oct. 8 - Oct. 11, 2006.
- International Conference on Development and Learning, Bloomington, IN, May 31 - June 3, 2006. Also a member of the Organizing Committee.
- IEEE International Conference on Systems, Man, and Cybernetics (SMC 2005), Hawaii, October 2005.
- Developmental Robotics Symposium, 2005 AAAI Spring Symposiums, Stanford University, Stanford, CA, March 21-23, 2005.
- IEEE International Joint Conference on Neural Networks, Budapest, Hungary, July 25-29, 2004.
- Workshop on Statistical Learning in Computer Vision, Prague, Czech Republic, May, 15, 2004.
- Asian Conference of Computer Vision, Jeju Island, Korea, January 28 - 30, 2004.
- IEEE International Symposium on Computational Intelligence in Robotics and Automation, Monterey, CA, Nov. 8-9, 1999.
- The 2nd International Conference on Audio- and Video-based Biometric Person Authentication, Washington, DC, March 22-24, 1999.
- IEEE Conf. Computer Vision and Pattern Recognition, Santa Barbara, CA, June 1998.
- IEEE International Conf. Image Processing, Chicago, IL Oct. 4-7, 1998.
- IEEE 3rd International Conference on Automatic Face- and Gesture-Recognition, Nara, Japan, April 14-16, 1998.
- IEEE Conf. Computer Vision and Pattern Recognition, Puerto Rico, June 17-19, 1997.
- IEEE 2nd International Conference on Automatic Face- and Gesture-Recognition, Killington, Vermont, Oct. 14-16, 1996.
- IEEE International Symposium on Computer Vision, Coral Gables, Florida, November 20-22, 1995.
- International Conference on Neural Networks and Signal Processing, Nanjing, China, Dec. 1995.
- IEEE 1st International Conference on Image Processing, Austin, Texas, Nov. 1994.
- 12th International Conference on Pattern Recognition, Jerusalem, Israel, Oct. 1994.
- International Symposium of Young Investigators on Information, Computer and Control, Beijing, China, Feb. 1994.

- *Withrow Distinguished Scholar Award*, College of Engineering, MSU, 1998.
- *Outstanding Mentor Award*, MSU Ronald E. McNair Post-Baccalaureate Achievement Program, 1997.
- *NSF Research Initiation Award*, 1994.
- *Sigma Xi Outstanding Student Research Paper Award*, University of Illinois, 1987.
- *Member*, IEEE Computational Intelligence Society, Society for Neuroscience, IEEE Computer Society, International Neural Network Society, Association for Computing Machinery, American Association for Artificial Intelligence, American Association for the Advancement of Science, American Society for Engineering Education, and Phi Beta Delta Honor Society for International Scholars.
- Shanghai Ethics-Scholarship-Health Award (Shi San Hao Xue Sheng), one from each Department of Universities, China, 1981.
- Shanghai Ethics-Scholarship-Health Award (Shi San Hao Xue Sheng), one from each Department of Universities, China, 1980.
- Fudan Ethics-Scholarship-Health Award (Xiao San Hao Xue Sheng), China, 1979.

Popular Press Articles Written by News Reporters

1. 01/25/01 (BBC, UK). “Time for Real Intelligence?” by Ivan Noble at BBC, UK. An electronic version available at
http://news.bbc.co.uk/hi/english/sci/tech/newsid_1136000/1136870.stm
2. 01/26/01 (UPI, USA). “Robot Learns Like a Child” by Jean Lawrence at United Press International. An electronic version available at
<http://www.newsmax.com/archives/articles/2001/1/25/195307.shtml>
3. 03/01/01 (TP, Singapore). “Bring On the Intelligent Robot” by Steven Lewis at Times Publishing Limited, Singapore. An electronic version available at
<http://www.tpl.com.sg/timesnet/data/ab/docs/ab2757.html>
4. 08/01 (Enel, Italy). “La mente del robot (The Mind of Robot)” by Michela Bertolani at Boiler Magazine, Italy. An electronic version available at
<http://www.enel.it/it/enel/magazine/boiler/boiler26/html/articoli/Bertolani-Intelligenza.asp>
5. 08/16/01 (KRN, US). “Like a Child, ‘Smart’ Robot Learns Gradually” by Robert S. Boyd at Knight Ridder Newspapers. This article appeared in about 30 US newspapers, including *Detroit Free Press* (08/17/01) and *Philadelphia Inquirer* (08/23/01). An electronic version available at
http://www.freep.com/money/tech/robot17_20010817.htm
6. Winter, 2002 (Exploratorium Magazine, US). “Bringing up Baby” by Erica Klarreich. *Exploratorium Magazine*, vol. 25, No 4, Winter 2001/2002, pp. 18-20. An electronic version is available at
<http://www.cse.msu.edu/~weng/media/Exploratorium/Exploratorium.pdf>
7. 02/23/2003 (Lansing State Journal) “Dav, A Robotic Soldier, or Just Maybe a Maid,” by Sharon Terlep at Lansing State Journal. An electronic version is available at
http://www.lsj.com/news/campus/p_030223_research_robot_8a.html
8. 06/09/2003 (Detroit Free Press) “Possibilities Limitless for MSU’s Thinking Robots” by Mike Wendland at Detroit Free Press. An electronic version is available at
<http://www.cse.msu.edu/~weng/media/FreePress2003-6-9.pdf>
9. 06/18/2003 (Technology Review) “Teachable Robots” by Rebecca Zacks at Technology Review, July/August issue, 2003. An electronic version is available at
<http://www.cse.msu.edu/~weng/media/TechReviewJuly2003.pdf>
10. 09/10/2003 (Discovery Channel) Filming SAIL and Dav robot projects for Discovery Channel Technowledge Series. Aired on the Discovery Channel 2003 and 2004. Producer and Director: Matt Borten.
11. 11/5-11/2005: (New Scientist) “Brain Box,” by Douglas Fox, a cover story reporting the biologically inspired Darwin and SAIL robots.

Publications

Books

1. J. Weng, *Natural and Artificial Intelligence: Introduction to Computational Brain-Mind*, BMI Press, 1st edition, ISBN: 978-0985875725, pp. 445, 2012; 2nd Edition, ISBN: 978-0-985875718, pp. 465, 2019.
2. J. Weng, T. S. Huang, and N. Ahuja, *Motion and Structure from Image Sequences*, Springer-Verlag, ISBN: 978-3642776458, pp. 444, 1993.

Articles in Refereed Journals

3. J. Weng, "Autonomous Programming for General Purposes: Theory," *International Journal of Humanoid Robotics*, vol. 17, no. 4, pp. 1-36, August 2020.
4. J. Weng, "A Unified Hierarchy for AI and Natural Intelligence through Auto-Programming for General Purposes," *Journal of Cognitive Science*, vol. 21, no. 1, pp. 53-102, 2020.
5. Xiang Wu and Juyang Weng, "Neuron-Wise Inhibition Zones and Auditory Experiments," *IEEE transactions on Industrial Electronics*, vol. 66, no. 12, pp. 9581-9590, December 2019.
6. Zejia Zheng, Xiang Wu, and J. Weng, "Emergent Neural Turing Machine and Its Visual Navigation," *Neural Networks*, vol. 110, pp. 116-130, Feb. 2019.
7. D. Wang, Y. Duan, and J. Weng, "Motivated Optimal Developmental Learning for Sequential Tasks without Using Rigid Time-Discounts," *IEEE Transactions on Neural Networks and Learning Systems*, vol. 29, no. 10, pp. 4917-4931, October 2018.
8. X. Wu, Y. Bo and J. Weng, "Information-Dense Actions as Contexts," *Neurocomputing*, vol. 311, pp. 164-175, 2018.
9. X. Song, W. Zhang and J. Weng, "Types, Locations, and Scales from Cluttered Natural Video and Actions," *IEEE transactions on Autonomous Mental Development*, vol. 7, no. 4, pp. 273-286, December 2015.
10. Z. Ji and J. Weng, "A Developmental Where-What Network for Concurrent and Interactive Visual Attention and Recognition," *Robotics and Autonomous Systems*, vol. 71, pp. 35-48, September. 2015.
11. J. Weng, "Brain as an Emergent Finite Automaton: A Theory and Three Theorems." *International Journal of Intelligence Science*, vol. 5, no. 2, pp. 112-131, January 2015.
12. J. Weng and Matthew D. Luciw, "Brain-Inspired Concept Networks: Learning Concepts from Cluttered Scenes," *IEEE Intelligent Systems Magazine*, vol. 29, no. 6, pp. 14-22, 2014.
13. J. Weng, M. D. Luciw and Q. Zhang, "Brain-Like Emergent Temporal Processing: Emergent Open States," *IEEE transactions on Autonomous Mental Development*, vol. 5, no. 2, pp. 89 - 116, 2013.
14. J. Weng, S. Paslaski, J. Daly, C. VanDam and J. Brown, "Modulation for Emergent Networks: Serotonin and Dopamine," *Neural Networks*, vol. 41, pp. 225-239, 2013.
15. M. Solgi, T. Liu and J. Weng, "A Computational Developmental Model for Specificity and Transfer in Perceptual Learning," *Journal of Vision*, vol. 13, no. 1, ar. 7, pp. 1-23, 2013.

16. J. Weng and M. Luciw, "Brain-Like Emergent Spatial Processing," *IEEE transactions on Autonomous Mental Development*, vol. 4, no. 2, pp. 161-185, 2012.
17. J. Weng, "Symbolic Models and Emergent Models: A Review," *IEEE Transactions on Autonomous Mental Development*, vol. 4., no. 1, pp. 29-53, 2012.
18. J. Weng, "Why Have We Passed 'Neural Networks Do Not Abstract Well'?", *Natural Intelligence: the INNS Magazine*, vol. 1, no.1, pp. 13-22, 2011.
19. Z. Ji, M. Luciw, J. Weng, and S. Zeng, "Incremental online object learning in a vehicular radar-vision fusion framework," *IEEE Transactions on Intelligent Transportation Systems*, vol. 12, no. 2, pp. 402-411, 2011.
20. M. Luciw and J. Weng, "Top-Down Connections in Self-Organizing Hebbian Networks: Topographic Class Grouping," *IEEE Transactions on Autonomous Mental Development*, vol. 2, no. 3, pp. 248-. 261, September, 2010.
21. Y. Zhang and J. Weng, "Spatiotemporal Multimodal Developmental Learning," *IEEE Transactions on Autonomous Mental Development*, vol. 2, no. 3, pp. 149-166, 2010.
22. M. Solgi and J. Weng, "Developmental Stereo: Emergence of Disparity Preference in Models of Visual Cortex," *IEEE Transactions on Autonomous Mental Development*, vol. 1, no. 4, pp. 238-252, 2009.
23. J. Weng and M. Luciw, "Dually Optimal Neuronal Layers: Lobe Component Analysis," *IEEE Transactions on Autonomous Mental Development*, vol. 1, no. 1, pp. 68-85, 2009.
24. D. Chen, L. Zhang and J. Weng, Spatio-temporal Adaptation in the Unsupervised Development of Networked Visual Neurons, *IEEE Transactions on Neural Networks*, vol. 20, no. 6, pp. 992-1008, 2009.
25. J. Weng, "Task Muddiness, Intelligence Metrics and the Necessity of Autonomous Mental Development," *Minds and Machines*, vol. 19, pp. 93-115, 2009.
26. J. Weng, T. Luwang, H. Lu, X. and Xue, "Multilayer In-place Learning Networks for Modeling Functional Layers in the Lamina Cortex," *Neural Networks*, vol. 21, no.2-3, pp. 150-159, 2008.
27. J. Weng, T. Luwang, H. Lu, and X. Xue, "A Multilayer In-Place Learning Network for Development of General Invariances," *International Journal of Humanoid Robotics*, vol. 4, no. 2, pp. 281-320, 2007.
28. S. Zeng and J. Weng, "Online-learning and attention-based approach to obstacle avoidance using a range finder," *Journal of Intelligent and Robotic Systems*, vol. 50, no. 3, pp. 219-239, 2007.
29. X. Huang and J. Weng, "Inherent Value Systems for Autonomous Mental Development," *International Journal of Humanoid Robotics*, vol. 4, no. 2, pp. 407-433, 2007.
30. Y. Zhang and J. Weng, "Task Transfer by a Developmental Robot," *IEEE Transactions on Evolutionary Computation*, vol. 11, no. 2, pp. 226-248, 2007.
31. J. Weng and W. Hwang, "Incremental Hierarchical Discriminant Regression," *IEEE Transactions on Neural Networks*, vol. 18, no. 2, pp. 397-415, 2007
32. J. Weng, "On Developmental Mental Architectures," *Neurocomputing*, vol. 70, no. 13-15, pp. 2303-2323, 2007.

33. J. Weng and W. Hwang, "From Neural Networks to the Brain: Autonomous Mental Development," *IEEE Computational Intelligence Magazine*, vol. 1, no. 3, pp. 15-31, 2006.
34. P. K. Mckinley, B. H. C. Cheng, and J. Weng, "Integrating Multimedia Technology into the Undergraduate Curriculum," *International Journal of Engineering Education*, vol. 22, no. 4, pp. 829-838, 2006.
35. G. Abramovich, J. Weng and D. Dutta, "Adaptive Part Inspection through Developmental Vision," *ASME Transactions, Journal of Manufacturing Science and Engineering*, vol. 127, no. 4, pp. 846-856, Nov. 2005.
36. J. Weng and S. Zeng, "A Theory of Developmental Mental Architecture and The Dav Architecture Design," *International Journal of Humanoid Robotics*, vol. 2, no. 2, pp. 145-179, 2005.
37. Y. Zhang, J. Weng and W. Hwang, "Auditory Learning: A Developmental Method," *IEEE Transactions on Neural Networks*, vol. 16, no. 3, pp. 601-616, 2005.
38. J. Weng, "Developmental Robotics: Theory and Experiments," *International Journal of Humanoid Robotics*, vol. 1, no. 2, pp. 199-235, 2004.
39. J. Weng, "Autonomous mental development: A new frontier for computational intelligence," *IEEE Connections: The Newsletter of the IEEE Neural Networks Society*, (invited feature article) vol. 1, no. 4, pp. 8 - 13, 2003.
40. A. Joshi and J. Weng, "Autonomous mental development in high dimensional context and action spaces," *Neural Networks*, vol. 16, no. 5-6, pp. 701-710, 2003.
41. J. Weng, Y. Zhang and W. Hwang, "Candid Covariance-free Incremental Principal Component Analysis," *IEEE Trans. Pattern Analysis and Machine Intelligence*, vol. 25, no. 8, pp. 1034-1040, 2003.
42. J. Weng and W. Hwang, "Online Image Classification Using IHDR," *International Journal on Document Analysis and Recognition*, vol. 5, no. 2-3, pp. 118-125, 2003.
43. J. Weng and I. Stockman, "Autonomous Mental Development: Workshop on Development and Learning," *AI Magazine*, vol. 23, no. 2, pp. 95-98, 2002.
44. J. Weng, W. Hwang and Y. Zhang, "SAIL: A 'Mentally' Developing Robot," **invited article**, *Robotics and Machine Perception*, (SPIE International Technical Group Newsletter), vol. 11, no. 1, pp. 1 and 9, Feb. 2002.
45. C. Yang and J. Weng, "Visual Motion Based Behavior Learning Using Hierarchical Discriminant Regression," *Pattern Recognition Letters*, vol. 23, no. 8, pp. 1031-1038, 2002.
46. J. Weng, J. McClelland, A. Pentland, O. Sporns, I. Stockman, M. Sur and E. Thelen, "Autonomous Mental Development by Robots and Animals," **Science**, vol. 291, no. 5504, pp. 599-600, Jan. 26, 2001.
47. J. Weng and K. Y. Guentchev, "3-D Sound Localization from a Compact Noncolpanar Array of Microphones Using Tree-Based Learning," *Journal of the Acoustical Society of America*, vol. 110, no. 1, pp. 310 - 323, July 2001.
48. W. S. Hwang and J. Weng, "Hierarchical Discriminant Regression," *IEEE Trans. Pattern Analysis and Machine Intelligence*, vol. 22, no. 11, pp. 1277 - 1293, Nov. 2000.
49. S. Chen and J. Weng, "State-Based SHOSLIF for Indoor Visual Navigation," *IEEE Trans. Neural Networks*, vol. 11, no. 6, pp. 1300 - 1314, Nov. 2000.

50. J. Weng and S. Chen, "Visual Learning with Navigation as an Example," *IEEE Intelligent Systems*, vol. 15, no. 5, pp. 63-71, 2000.
51. Y. Cui and J. Weng, "Appearance-Based Hand Sign Recognition from Intensity Image Sequences," *Computer Vision and Image Understanding*, vol. 78, pp. 157-176, 2000.
52. Y. Cui and J. Weng, "A Learning-based prediction-and-verification segmentation scheme for hand sign image sequences," *IEEE Trans. Pattern Analysis and Machine Intelligence*, vol. 21, no. 8, pp. 798-804, August 1999.
53. D. L. Swets and J. Weng, "Hierarchical discriminant analysis for image retrieval," *IEEE Trans. Pattern Analysis and Machine Intelligence*, vol. 21, no. 5, pp. 386 - 401, May 1999.
54. J. Weng and S. Y. Chen, "Vision-guided navigation using SHOSLIF," *Neural Networks*, vol. 11, pp. 1511-1529, 1998.
55. D. L. Swets, Y. Pathak and J. Weng, "An Image Database System with Support for Traditional Alphanumeric Queries and Content-Based Queries by Example," *Multimedia Tools and Applications*, vol. 7, no. 3, pp. 181-212, Nov. 1998.
56. J. Weng, Y. Cui and N. Ahuja, "Transitory image sequences, asymptotic properties, and estimation of motion and structure," *IEEE Trans. Pattern Analysis and Machine Intelligence*, vol. 19, no. 5, pp. 451-464, 1997.
57. C. Dorai, J. Weng and A. Jain, "Optimal registration of object views using range data," *IEEE Trans. Pattern Analysis and Machine Intelligence*, vol. 19, no. 10, pp. 1131- 1138, 1997.
58. J. Weng, N. Ahuja and T. S. Huang, "Learning recognition and segmentation using the Cresceptron," *International Journal of Computer Vision*, vol. 25, no. 2, pp. 105-139, Nov. 1997.
59. J. Weng, A. Singh and M. Y. Chiu, "Learning-Based Ventricle Detection from Cardiac MR and CT Images," *IEEE Trans. on Medical Imaging*, vol. 16, no. 4, pp. 378-391, Aug. 1997.
60. D. L. Swets and J. Weng, "Using discriminant eigenfeatures for image retrieval," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 18, no. 8, pp. 831-836, Aug. 1996.
61. Y. Cui, J. Weng and H. Reynolds, "Estimation of ellipse parameters using optimal minimum variance estimator," *Pattern Recognition Letters*, vol. 17, pp. 309-316, March 1996.
62. J. Weng and T. S. Huang, "Performance of computer vision algorithms," *Computer Vision, Graphics, and Image Processing: Image Understanding*, vol. 60, no. 2, pp. 253-256, Sept. 1994.
63. N. Cui, J. Weng and P. Cohen, "Extended structure and motion analysis from monocular image sequences," *Computer Vision, Graphics, and Image Processing: Image Understanding*, vol. 59, no. 2, pp. 154-170, March 1994.
64. J. Weng, "Image matching using the windowed Fourier phase," *International Journal of Computer Vision*, vol. 11, no. 3, pp. 211-236, 1993.
65. J. Weng, N. Ahuja, and T. S. Huang, "Optimal motion and structure estimation," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 15, no. 9, pp. 864-884, Sept. 1993.
66. J. Weng, "Windowed Fourier phase: completeness and signal reconstruction," *IEEE Transactions on Signal Processing*, vol. 41, no. 2, pp. 657-666, Feb. 1993.

67. J. Weng, P. Cohen and M. Herniou, "Camera calibration with distortion models and accuracy evaluation," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 14, no. 10. pp. 965-980, Oct. 1992.
68. J. Weng, N. Ahuja, and T. S. Huang, "Matching two perspective views," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 14, no. 8. pp. 806-825, Aug. 1992.
69. J. Weng, P. Cohen and N. Rebibo, "Motion and structure estimation from stereo image sequences," *IEEE Transactions on Robotics and Automation*, vol. 8, no. 3, pp. 362-382, June. 1992.
70. J. Weng, T. S. Huang, and N. Ahuja, "Motion and structure from line correspondences: closed-form solution, uniqueness, and optimization," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 14, no. 3, pp. 318-336, March 1992.
71. J. Weng, N. Ahuja, and T. S. Huang, "Motion and structure from point correspondences: planar surfaces," *IEEE Transactions on Signal Processing*, vol. 39, no. 12, pp. 2691-2717, Dec. 1991.
72. J. Weng, T. S. Huang, and N. Ahuja, "Motion and structure from two perspective views: algorithm, error analysis and error estimation," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 11, no. 5, pp. 451-476, May. 1989. Also **reprinted** in R. Kasturi and R. Jain (eds.), *Computer Vision: Advances and Applications*, IEEE Computer Society Press, pp. 352-377, 1991.
73. J. Weng, T. S. Huang, and N. Ahuja, "3-D motion estimation, understanding and prediction from noisy image sequences," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 9, no. 3, pp. 370-389, 1987.
74. J. Weng and N. Ahuja, "Octree of objects in arbitrary motion: representation and efficiency," *Computer Vision, Graphics, and Image Processing*, vol. 39, pp. 167-185, 1987.

Articles in Refereed Conference or Workshop Proceedings

75. J. Weng, "20 million-dollar problems for any brain models and a holistic solution: Conscious learning", in Proc. International Joint Conference on Neural Networks, pp. 1-9, Padua, Italy, July 18-23, 2022. <http://www.cse.msu.edu/~weng/research/20M-IJCNN2022rvsd-cite.pdf>
76. J. Weng, "An Algorithmic Theory of Conscious Learning", in Proc. 2022 3rd International Conf. on Artificial Intelligence in Electronics Engineering, pp. 1-10, Bangkok, Thailand, Jan. 21-23, 2022. <http://www.cse.msu.edu/~weng/research/ConsciousLearning-AIEE22rvsd-cite.pdf>
77. J. Weng, "3D-to-2D-to-3D Conscious Learning", in Proc. IEEE 40th International Conference on Consumer Electronics, pp. 1-6, Las Vegas NV, USA, Jan.7-9, 2022. <http://www.cse.msu.edu/~weng/research/ConsciousLearning-ICCE-2022-rvsd-cite.pdf>
78. J. A. Knoll, J. Honer, S. Church, and J. Weng, "Optimal Developmental Learning for Multisensory and Multi-Teaching Modalities," in Proc. International Conference on Development and Learning, Beijing, China, pp. 1-6, Aug. 23-26, 2021.
79. J. Weng, "A Developmental Method that Computes Optimal Networks without Post-Selections," in Proc. IEEE International Conference on Development and Learning, Beijing, China, pp. 1-6, Aug. 23-26, 2021.
80. J. Weng, "On Post Selections Using Test Sets (PSUTS) in AI," in Proc. International Joint Conference on Neural Networks, Shenzhen, China, pp. 1-8, July 18-22, 2021.

81. X. Wu and J. Weng, "On Machine Thinking" in Proc. International Joint Conference on Neural Networks, Shenzhen, China, pp. 1-8, July 18-22, 2021.
82. J. Weng, "Machines Develop Consciousness through Autonomous Programming for General Purposes (APFGP)," Springer Lecture Notes on Communication, Proc. of IJCAI Workshop on Human Brain and Artificial Intelligence, Yokohama, Japan, 17 pages, Jan. 7, 2021.
83. J. Honer, A. Fadool and J. Weng, "User Flagging for Posts at 3DTube.org: the First Social Platform for 3D-Exclusive Contents," in Proc. 37th International Conf. Social Networks Analysis, Management and Security (SNAMAS-2020), Paris, pp. 1-6, December 14-16, 2020.
84. J. Weng, "Conscious Intelligence Requires Developmental Autonomous Programming For General Purposes," in Proc. IEEE International Conference on Development and Learning and Epigenetic Robotics, Valparaiso, Chile, pp. 1-7, Oct. 26-27, 2020.
85. J. A. Knoll, V. -N. Hoang, J. Honer, S. Church, T. -H. Tran, and J. Weng, "Fast Developmental Stereo-Disparity Detectors," in Proc. IEEE International Conference on Development and Learning and Epigenetic Robotics, Valparaiso, Chile, pp. 1-6, Oct. 26-27, 2020.
86. J. Weng, Z. Zheng, X. Wu, and J. Castro-Garcia, "Autonomous Programming for General Purposes: Theory and Experiments," in Proc. International Joint Conference on Neural Networks, Glasgow, UK, pp. 1-8, July 19 - 24, 2020.
87. X. Wu and J. Weng, "Muscle Vectors as Temporally Dense 'Labels'," in Proc. International Joint Conference on Neural Networks, Glasgow, UK, pp. 1-8, July 19 - 24, 2020.
88. J. Weng, Juan Castro-Garcia, Zejia Zheng and Xiang Wu, "Task-Nonspecific and Modality-Nonspecific AI," in Proc. IJCAI Joint Workshop Human Brain and Artificial Intelligence, Macau, pp.1-17, August 11, 2019.
89. J. Weng, "Meanings of 'Data' and 'Rules' Emerge as Actions through Auto-Programming for General Purposes," in Proc. IJCAI Workshop on Bringing Semantic Knowledge into Vision and Text Understanding, Macau, pp. 1-7, August 11, 2019.
90. J. Castro-Garcia and J. Weng, "Emergent Multilingual Language Acquisition using Developmental Networks," in Proc. International Joint Conf. Neural Networks, IEEE Press, Budapest, Hungary, pp. 1-8, July 14-19, 2019.
91. X. Wu and J. Weng, "The Emergent-Context Emergent-Input Framework for Temporal Processing," in Proc. International Joint Conference on Neural Networks, IEEE Press, Budapest, Hungary, pp. 1-8, July 14-19, 2019.
92. J. Weng, Z. Zheng, X. Wu, J. Castro-Garcia, S. Zhu, Q. Guo, and X. Wu, "Emergent Turing Machines and Operating Systems for Brain-Like Auto-Programming for General Purposes," in Proc. AAAI 2018 Fall Symposium: Gathering for Artificial Intelligence and Natural Systems, Arlington, Virginia, pp. 1-7, October 18 - 20, 2018.
93. Z. Zheng, X. Wu, and J. Weng, "Emergent Turing Machine as a General Purpose Approximator," in Proc. International Joint Conference on Neural Networks, Rio de Janeiro, Brazil, pp. 1-8, July 8-13, 2018.
94. X. Wu, Z. Zheng, and J. Weng, "Sensorimotor in Space and Time: Audition," in Proc. International Joint Conference on Neural Networks, Rio de Janeiro, Brazil, pp. 1-8, July 8-13, 2018.

95. X. Wu, Z. Zheng and J. Weng, "Entropy as Temporal Information Density," in Proc. International Joint Conference on Fuzzy Systems, Rio de Janeiro, Brazil, pp. 1-8, July 8-13, 2018.
96. X. Wu and J. Weng, "Actions as Contexts," in Proc. International Joint Conference on Neural Networks, Anchorage, Alaska, pp. 214-221, May 14-17. 2017.
97. Z. Zheng and J. Weng, "Challenges in Visual Parking and How a Developmental Network Approaches the Problem," in Proc. International Joint Conference on Neural Networks, Vancouver, Canada, pp. 1-8, July 24-29. 2016.
98. J. Weng, "Brains as Optimal Emergent Turing Machines," in Proc. International Joint Conference on Neural Networks, Vancouver, Canada, pp. 1817-1824, July 24-29. 2016.
99. Z. Zheng and J. Weng, "Mobile Device Based Outdoor Navigation With On-line Learning Neural Network: a Comparison with Convolutional Neural Network," in Proc. 7th Workshop on Computer Vision in Vehicle Technology (CVVT 2016) at CVPR 2016, Las Vega, pp. 11-18, June 26, 2016.
100. Z. Zheng and J. Weng, "Challenges in Visual Parking and How a Developmental Network Approaches the Problem", in Proc. International Joint Conference on Neural Networks, Vancouver, Canada, pp. 4593-4600, July 24-29. 2016.
101. Q. Guo, X. Wu, and J. Weng, "Gross-Domain and Within-Domain Synaptic Maintenance for Autonomous Development of Visual Areas," in Proc. the Fifth Joint IEEE International Conference on Development and Learning and on Epigenetic Robotics, Providence, RI, pp. 78-83, August 13-16, 2015.
102. M. Solgi and J. Weng, "WWN-8: Incremental Online Stereo with Shape-from-X Using Life-Long Big Data from Multiple Modalities," in Proc. INNS Conference on Big Data, San Francisco, pp. 316-326, August 8-10, 2015.
103. Z. Zheng, X. He, and J. Weng, "Approaching Camera-Based Real-World Navigation Using Object Recognition, in Proc. INNS Conference on Big Data, San Francisco, pp. 428-436, August 8-10, 2015.
104. J. Weng, "Brains as Naturally Emerging Turing Machines," in Proc. International Joint Conference on Neural Networks, Killarney, Ireland, 8 pages, July 12-17. 2015.
105. Z. Zheng and J. Weng, "Approaching Real-World Navigation Using Object Recognition Network," in Proc. International Joint Conference on Neural Networks, Killarney, Ireland, 8 pages, July 12-17. 2015.
106. J. Weng, "A Bridge-Islands Model for Brains: Developing Numeric Circuits for Logic and Motivation ," in Proc. International Joint Conference on Neural Networks, Beijing, pp. 2608-2615, July 7-13, 2014.
107. P. Gan and J. Weng, "The Short-Context Priority of Emergent Representations in Unsupervised Learning," in Proc. 10th International Conference on Natural Computation, Xiaman, China, pp. 30-35, August 19-21, 2014.
108. Z. Zheng, K. Qian, J. Weng, and Z. Zhang, "WWN: Integration with Coarse-to-fine, Supervised and Reinforcement Learning," in Proc. International Joint Conference on Neural Networks, Beijing, pp. 1517-1524, July 7-13. 2014.
109. Q. Guo, X. Wu, and J. Weng, "WWN-9: Cross-Domain Synaptic Maintenance and Its Application to Object Groups Recognition," in Proc. International Joint Conference on Neural Networks, Beijing, pp. 716-723, July 7-13, 2014.

110. D. Wang, Y. Duan, and J. Weng, "Serotonin and Dopamine Systems for Sequential Tasks," in Proc. International Joint Conference on Neural Networks, Beijing, pp. 3379-3386, July 7-13, 2014.
111. Z. Zheng and J. Weng, "Comparison between WNN and Some Prior Networks," in Proc. International Conference on Brain-Mind, Beijing, 8 pages, July 14-15, 2014.
112. D. Wang, Y. Duan, and J. Weng, "Neuromorphic Motivational Systems for Sequential Tasks in Dynamic Environment," in Proc. International Conference on Brain-Mind, Beijing, 8 pages, July 14-15, 2014.
113. Z. Zheng, K. Qian, J. Weng, and Z. Zhang, "Modeling the Effects of Neuromodulation on Internal Brain Areas: Serotonin and Dopamine," in Proc. International Joint Conference on Neural Networks, Dallas, TX, 8 pages, August 4-9, 2013.
114. J. Fish, L. Ossian, and J. Weng, "Novelty Estimation in Developmental Networks: Acetylcholine and Norepinephrine," in Proc. International Joint Conference on Neural Networks, Dallas, TX, 8 pages, August 4-9, 2013.
115. M. Solgi and J. Weng, "Stereo Where-What Networks: Unsupervised Binocular Feature Learning," in Proc. International Joint Conference on Neural Networks, Dallas, TX, 8 pages, August 4-9, 2013.
116. H. Ye, X. Huang, and J. Weng, "Neural Modulation for Reinforcement Learning in Developmental Networks Facing an Exponential No. of States," in Proc. International Conference on Brain-Mind, July 27 - 28, East Lansing, Michigan, pp. 27-34, 2013.
117. Weng, "Establish the Three Theorems: DP Optimally Self-Programs Logics Directly from Physics," in Proc. International Conference on Brain-Mind," July 27 - 28, East Lansing, Michigan, pp. 19-26, 2013.
118. X. Wu, Q. Guo, and J. Weng, "Skull-closed Autonomous Development: WNN-7 Dealing with Scales," in Proc. International Conference on Brain-Mind, July 27 - 28, East Lansing, Michigan, pp. 1-8, 2013.
119. N. Wagle and J. Weng, "Developing Dually Optimal LCA Features in Sensory and Action Spaces for Classification," In Proc. the 2nd Joint IEEE International Conference on Development and Learning and on Epigenetic Robotics, San Diego, CA, 8 pages, Nov. 7 - 9, 2012.
120. J. Weng, "A Theory on the Completeness of the DN Logic Capability," In Proc. International Conference on Brain-Mind, July 14-15, East Lansing, Michigan, USA, pp. 35-42, 2012.
121. Y. Wang, X. Wu and J. Weng, "Skull-closed Autonomous Development: Object-wise Incremental Learning," in Proc. 9th International Symposium on Neural Networks, Shengyang, pp. 590-597, July 11 - July 14, 2012.
122. H. Ye, X. Huang, and J. Weng, "Inconsistent Training for Developmental Networks and the Applications in Game Agents," In Proc. International Conference on Brain-Mind, July 14-15, East Lansing, Michigan, USA, pp. 43-50, 2012.
123. Y. Wang, X. Wu and J. Weng, "Brain-Like Learning Directly from Dynamic Cluttered Natural Video," in Proc. International Conference on Brain-Mind, July 14-15, East Lansing, Michigan, USA, pp. 51-58, 2012.
124. Y. Wang, X. Wu and J. Weng, "Skull-Closed Autonomous Development: WNN-6 Using Natural Video," in Proc. Int'l Joint Conference on Neural Networks, June 10-15, Brisbane, Australia, 8 pages, 2012.
125. Y. Wang, X. Wu and J. Weng, "Skull-Closed Autonomous Development," In Proc. International Conference on Neural Information Processing (ICONIP 2011), Shanghai, China, Nov. 14-17, 10 pages, 2011.

126. J. Weng, "Three Theorems: Brain-Like Networks Logically Reason and Optimally Generalize," in 2011 Int'l Joint Conference on Neural Networks, San Jose, California, pp. 2983-2990, July 31 - August 5, 2011.
127. X. Song, W. Zhang, and J. Weng, "Where-What Network 5: Dealing with Scales for Objects in Complex Backgrounds," in Proc. 2011 Int'l Joint Conference on Neural Networks, San Jose, California, pp. 2795-2802, July 31 - August 5, 2011.
128. Y. Wang and X. Wu and J. Weng, "Synapse Maintenance in the Where-What Network," in Proc. Int'l Joint Conference on Neural Networks, San Jose, CA, pp. 2823-2829, July 31 - August 5, 2011.
129. J. Daly and J. Brown and J. Weng, "Neuromorphic Motivated Systems," in Proc. Int'l Joint Conference on Neural Networks," San Jose, CA, pp. 2917-2924, July 31 - August 5, 2011.
130. S. Paslaski and C. VanDam and J. Weng, "Modeling Dopamine and Serotonin Systems in a Visual Recognition Network," in Proc. Int'l Joint Conference on Neural Networks, San Jose, CA, pp. 3016-3023, July 31 - August 5, 2011.
131. J. Weng, "A Computational Introduction to the Brain-Mind," in Proc. 2011 INNS International Educational Symposium on Neural Networks, Lima, Peru, 11 pages, January, 25-27, 2011.
132. Y. Wang, X. Wu, X. Song, W. Zhang, J. Weng. "Where-What Network with CUDA: General Object Recognition and Location in Complex Backgrounds," in Proc. International Symposium on Neural Networks (ISNN 2011), Guilin, China, 10 pages, May 29 - June 1, 2011, Lecture Notes in Computer Science, 2011, Volume 6676/2011, 331-341, DOI: 10.1007/978-3-642-21090-7_39.
133. Y. Wang, X. Wu, X. Song, W. Zhang, and J. Weng, "A Biologically-Inspired Network for Generic Object Recognition Using CUDA," in Proc. 2nd World Congress on Computer Science and Information Engineering (CSIE 2011), Changchun, China, June 17-19, 2010.
134. X. Song, Y. Wang, W. Zhang, Z. Wu, H. Lu, X. Xue and J. Weng, "The Architecture and Recognition Algorithm in Haibao Perceptual Development Robot," in Proc. IEEE International Conference on Robotics and Biomimetics, Tianjin, China, pp. 417-422, Dec. 14-18, 2010.
135. K. Miyan and J. Weng, "WWN-Text: Cortex-Like Language Acquisition with ??What?? and ??Where??," in Proc. IEEE 9th International Conference on Development and Learning," Ann Arbor, pp. 280-285, August 18-21, 2010.
136. M. Luciw and J. Weng, "Where What Network 4: The Effect of Multiple Internal Areas," in Proc. IEEE 9th International Conference on Development and Learning, Ann Arbor, pp. 311-316, August 18-21, 2010.
137. J. Weng, "A 5-Chunk Developmental Brain-Mind Network Model for Multiple Events in Complex Backgrounds," in Proc. Int'l Joint Conference on Neural Networks, July 18-23, Barcelona, Spain, pp. 1-8, 2010. DOI: 10.1109/IJCNN.2010.5596740
138. J. Weng and M. Luciw, Online Learning for Attention, Recognition, and Tracking by a Single Developmental Framework, in Proc. 23rd IEEE Conference on Computer Vision and Pattern Recognition, 4th IEEE Online Learning for Computer Vision, 8 pages, June 13, 2010.
139. J. Weng, "A General Purpose Brain Model For Developmental Robots: The Spatial Brain for Any Temporal Lengths," in Proc. IEEE International Conference on Robotics and Automation, Workshop on Bio-Inspired Self-Organizing Robotic Systems, Anchorage, Alaska, May 3-8, 8 pages, 2010.

140. M. Luciw and J. Weng, "Where What Network 3: Developmental Top-Down Attention with Multiple Meaningful Foregrounds," in Proc. International Joint Conference on Neural Networks, Barcelona, Spain, pp. 4233-4240, July 18-23, 2010.
141. Z. Ji and J. Weng, "WWN-2: A Biologically Inspired Neural Network for Concurrent Visual Attention and Recognition," in Proc. International Joint Conference on Neural Networks, Barcelona, Spain, pp. 4247-4254, July 18-23, 2010.
142. M. D. Luciw and J. Weng, "Laterally connected lobe component analysis: Precision and topography," in Proc. IEEE 8th International Conference on Development and Learning, Shanghai, China, 8 pages, June 4-7, 2009. DOI: 10.1109/DEVLRN.2009.5175541
143. M. Solgi and J. Weng, "Temporal information as top-down context in binocular disparity detection," in Proc. IEEE 8th International Conference on Development and Learning, Shanghai, China, 8 pages, June 4-7, 2009.
144. J. Weng, "A Theory of Architecture for Spatial Abstraction," in Proc. IEEE 8th International Conference on Development and Learning, Shanghai, China, June 4-7, 2009.
145. J. Weng, Q. Zhang, M. Chi, and X. Xue, "Complex Text Processing by the Temporal Context Machines," in Proc. IEEE 8th International Conference on Development and Learning, Shanghai, China, June 4-7, 2009.
146. J. Weng, Y. Shen, M. Chi and X. Xue, "Temporal Context as Cortical Spatial Codes," in Proc. International Joint Conference on Neural Networks, Atlanta, Georgia, pp. 3348 - 3355, June 14-19, 2009.
147. M. Solgi and J. Weng, "Developmental Stereo: Topographic Iconic-abstract Map from Top-Down Connection," INNS New directions in Neural Networks Symposia (NNN 2008), Auckland, New Zealand, 8 pages, Nov. 24-25, 2008.
148. Z. Ji, J. Weng and D. Prokhorov, "Where-What Network 1: 'Where' and 'What' Assist Each Other Through Top-down Connections," IEEE International Conference on Development and Learning, Monterey, CA, pp. 61-66, Aug. 9-12, 2008.
149. M. Luciw, J. Weng, S. Zeng, "Motor Initiated Expectation through Top-Down Connections as Abstract Context in a Physical World," IEEE International Conference on Development and Learning, Monterey, CA, pp. 115-120, Aug. 9-12, 2008.
150. Z. Ji, X. Huang and J. Weng, "Learning of Sensorimotor Behaviors by a SASE Agent for Vision-based Navigation," World Congress on Computational Intelligence, Hong Kong, pp. 3374-3381, June 1-6, 2008.
151. M. Luciw and J. Weng, "Topographic Class Grouping with Applications to 3D Object Recognition," World Congress on Computational Intelligence, Hong Kong, pp. 3987 - 3994, June 1-6, 2008.
152. W. Zhang, H. Lu, R. Zhang, X. Xue, and J. Weng, "The Architecture and Body of FUWA Developmental Humanoid," in Proc. IEEE/ASME International Conference on Advanced Intelligent Mechatronics, (AIM2008), Xi'an, China, pp. 1037-1040, July 2-5, 2008.
153. Z. Ji, M. Luciw and J. Weng, "Epigenetic Sensorimotor Pathways and Its Application to Developmental Object Learning," World Congress on Computational Intelligence, Hong Kong, pp. 3938 - 3945, June 1-6, 2008.
154. W. Shi, J. Weng, M. Chi and X. Xue, "Multilayer In-place Learning Networks with Adaptive Lateral Connections: Models and Simulations," in Proc. 1st International Conference on Cognitive Neurodynamics, Shanghai, China, pp. 67-70, November 17-21, 2007.

155. L. Grabowski, M. Luciw and J. Weng, "A System for Epigenetic Concept Development through Autonomous Associative Learning," in Proc. IEEE International Conference on Development and Learning, London, pp. 175 - 180, July 11-13, 2007.
156. J. Weng, T. Luwang, W. Shi, L. Hong, M. Chi, and X. Xue, "Multilayer In-Place Learning Networks: Multitask Invariance and Adaptive Lateral Connections," in Proc. IEEE International Conference on Development and Learning, London, pp. 229-234, July 11-13, 2007.
157. H. Zhao, Z. Ji, and J. Weng, "Developmental Learning for Avoiding Dynamic Obstacles Using Attention," in Proc. IEEE International Conference on Development and Learning, London, pp. 318 - 323, July 11-13, 2007.
158. J. Weng, T. Luwang, H. Lu and X. Xue, "The Multilayer In-Place Learning Network for the Development of General Invariances and Multi-Task Learning," in Proc. IEEE/INNS International Joint Conference on Neural Networks, Orlando, Florida, August 12-17, 2007.
159. J. Lu and J. Weng, "Autonomous Learning in Gesture Recognition by Using Lobe Component Analysis," in Proc. IS&T/SPIE 19th Annual Symposium on Electronic Imaging, Image Processing: Algorithms and Systems V, San Jose, California, Jan. 28 - Feb. 1, 2007.
160. J. Weng, H. Lu, T. Luwang, and X. Xue, "In-Place Learning for Positional and Scale Invariance," in Proc. IEEE World Congress on Computational Intelligence, Vancouver, BC, Canada, July 16-21, 2006.
161. J. Weng and N. Zhang, "Optimal In-Place Learning and the Lobe Component Analysis," in Proc. IEEE World Congress on Computational Intelligence, Vancouver, BC, Canada, July 16-21, 2006.
162. J. Weng and M. D. Luciw, "Optimal In-Place Self-Organization for Cortical Development: Limited Cells, Sparse Coding and Cortical Topography," in Proc. 5th International Conference on Development and Learning (ICDL'06), Bloomington, IN, USA, May 31 - June 3, 2006.
163. Z. Ji, X. Huang, W. Tong and J. Weng, "On-line Learning for Covert and Overt Perceptual Capability for Vision-based Navigation," in Proc. 5th International Conference on Development and Learning (ICDL'06), Bloomington, IN, USA, May 31 - June 3, 2006.
164. J. Weng, W. Zhang, X. Xue, M. Tan, Z. Cao, S. Wang, D. Liu, X. An, H. Sun, H. He, Q. Cao, Y. Huang, J. Zhou, L. Yu, J. Han, and Y. Wang, "Research on Robot Learning and Development in China," in Proc. 5th International Conference on Development and Learning (ICDL'06), Bloomington, IN, USA, May 31 - June 3, 2006.
165. D. Chen, L. Zhang and J. Weng, "A Dynamic Predictive Coding System Based on Retina Biological Model," in Proc. 5th International Conference on Development and Learning (ICDL'06), Bloomington, IN, USA, May 31 - June 3, 2006.
166. X. Huang, J. Weng and Z. Zhang, "Adaptive User Activity Detection using Multimodal Context," in Proc. 3rd International Conference on Computational Intelligence, Robotics and Autonomous Systems, Dec. 14-16, 2005.
167. X. Huang and J. Weng, "Covert Perceptual Capability Development Using Reinforcement Learning," in Proc. 5th Int'l Workshop on Epigenetic Robotics, Nara, Japan, July 22-24, 2005.
168. J. Weng, "Muddy Tasks and the Necessity of Autonomous Mental Development," in Proc. 2005 AAAI Spring Symposiums, Developmental Robotics Symposium, Stanford University, Stanford, CA, March 21-23, 2005.

169. S. Zeng, N. Zhang and J. Weng, "Tree-Based Methods for Fuzzy Rule Extraction," in Proc. 18th Int'l FLAIRS Conference, pp. 387-393, 2005.
170. N. Zhang, S. Zeng and J. Weng, "Gradient Sparse Optimization via Competitive Learning," in Proc. 2005 IEEE International Conference on Acoustics, Speech, and Signal Processing, Philadelphia, PA, March 18-23, 2005.
171. J. Weng, "A Theory of Developmental Architecture," in Proc. International Conf. on Development and Learning, La Jolla, California, Oct. 20-22, 2004.
172. N. Zhang, S. Zeng and J. Weng, "Sparse Regression via the Winner-Take-All Networks," in Proc. International Conf. on Development and Learning, La Jolla, California, Oct. 20-22, 2004.
173. X. Huang and J. Weng, "Cross-Task Learning by a Developmental Agent," in Proc. International Conf. on Development and Learning, La Jolla, California, Oct. 20-22, 2004.
174. Y. Chen and J. Weng, "A Case Study of Developmental Robotics in Understanding 'Object Permanence'," in Proc. Brain Inspired Cognitive Systems Conference, Stirling, UK, August 29 - September 1, 2004.
175. Y. Chen, J. Weng and X. Huang, "'Object Permanence': Results From Developmental Robotics," in Proc. 2004 International Joint Conference on Neural Networks, Budapest, Hungary, July 26 - 29, 2004.
176. X. Huang and J. Weng, "Value System Development for a Robot," in Proc. 2004 International Joint Conference on Neural Networks, Budapest, Hungary, July 26 - 29, 2004.
177. N. Zhang, J. Weng, "Sparse Representation from a Winner-Take-All Neural Network," in Proc. of International Joint Conference on Neural Networks, Budapest, Hungary, July 26 - 29, 2004
178. X. Huang and J. Weng, "Motivational System for Human-Robot Interaction," in Proc. International Workshop on Human-Computer Interaction, Prague, May 16, 2004.
179. S. Zeng and J. Weng, "Obstacle Avoidance through Incremental Learning with Attention Selection," in Proc. IEEE Int'l Conf. on Robotics and Automation, New Orleans, Louisiana, April 26 - May 1, 2004.
180. X. Huang, J. Weng and Z. Zhang, "Office Presence Detection Using Multimodal Context Information," in Proc. IEEE Int'l Conference on Acoustics, Speech, and Signal Processing, Montreal, Quebec, Canada, May 17-21, 2004.
181. N. Zhang and J. Weng, "A Quasi-Optimally Efficient Algorithm for Independent Component Analysis," in Proc. IEEE Int'l Conference on Acoustics, Speech, and Signal Processing, Montreal, Quebec, Canada, May 17-21, 2004.
182. S. Zeng and J. Weng, "Online-learning and Attention-based Obstacle Avoidance Using a Range Finder," in Proc. the 17th Int'l FLAIRS Conference, Miami Beach, Florida, May 17-19, 2004.
183. G. Abramovich, J. Weng and D. Dutta, "A General-Purpose Architecture for Developmental Vision, in Proc. 6th Asian Conference on Computer Vision, Jeju, Korea, Jan. 27-30, 2004.
184. J. Weng and S. Zeng, "The Software Architecture Design of Dav Developmental Humanoid," in Proc. 2nd Int'l Conf. on Computational Intelligence, Robotics and Autonomous System, Singapore, Dec. 15-18, 2003.
185. Y. Zhang and J. Weng, "Conjunctive Visual and Auditory Development via Real-Time Dialogue," in Proc. 3rd Int'l Workshop on Epigenetic Robotics, Boston, MA, pp. 974 - 980, August 4-5, 2003.

186. S. Zeng, D. Cherba and J. Weng, "Dav Developmental Humanoid," in Proc. IEEE/ASME International Conference on Advanced Intelligent Mechatronics (AIM 2003), Kobe, Japan, pp. 974-980, July 20-24, 2003.
187. J. Weng, Y. Zhang and Y. Chen, "Developing Early Senses about the World: 'Object Permanence' and Visuoauditory Real-time Learning," in Proc. IEEE International Joint Conf. on Neural Networks, Portland, OR, pp. 2710 - 2715, July 20-24, 2003.
188. A. Joshi and J. Weng, "Autonomous Mental Development in High Dimensional State and Action Spaces," in Proc. IEEE International Joint Conf. on Neural Networks, Portland, OR, pp. 2928 - 2933, July 20-24, 2003.
189. J. Weng, Y. Zhang and W. Hwang, "CCIPCA: A Fast Incremental Principal Component Analysis Algorithm," in Proc. 3rd Int'l Conf. on Machine Learning and Data Mining, Leipzig, Germany, July 4 - July 7, 2003.
190. X. Huang and J. Weng, "Locally Balanced Incremental Hierarchical Discriminant Regression," in Proc. 4th Int'l Conf. on Intelligent Data Engineering and Automated Learning (IDEAL'03), Hong Kong, March 21-23, 2003.
191. J. Weng, Y. Zhang and W. S. Hwang "A Fast Algorithm for Incremental Principal Component Analysis," in Proc. 4th Int'l Conf. on Intelligent Data Engineering and Automated Learning (IDEAL'03), Hong Kong, March 21-23, 2003.
192. J. Weng, "A Theory for Mentally Developing Robots," in Proc. IEEE 2nd International Conference on Development and Learning (ICDL'02), Cambridge, MA, pp. 131-140, June 12-15, 2002.
193. J. Weng and Y. Zhang, "Developmental Robotics: A New Paradigm," **invited paper**, in Proc. Second International Workshop on Epigenetic Robotics: Modeling Cognitive Development in Robotic Systems, Edinburgh, Scotland, pp. 163-174, August 10 - 11, 2002.
194. Y. Zhang, and J. Weng, "Action Chaining by a Developmental Robot with a Value System," in Proc. IEEE 2nd International Conference on Development and Learning (ICDL'02), Cambridge, MA, pp. 53-60, June 12- 15, 2002.
195. X. Huang and J. Weng, Novelty and Reinforcement Learning in the Value System of Developmental Robots, in Proc. Second International Workshop on Epigenetic Robotics: Modeling Cognitive Development in Robotic Systems (EPIROB'02), Edinburgh, Scotland, pp. 47 - 55, August 10 - 11, 2002.
196. N. Zhang, J. Weng, and Z. Zhang, "A Developing Sensory Mapping for Robots," in Proc. IEEE 2nd International Conference on Development and Learning (ICDL'02), Cambridge, MA, pp. 13-20, June 12- 15, 2002.
197. Y. Zhang and J. Weng, "Chained Action Learning through Real-time Interactions," in Proc. of IEEE/INNS International Joint Conference of Neural Networks (IJCNN 2002), part of the World Congress on Computational Intelligence, Honolulu, HI, May 12-17, 2002.
198. J.D. Han, S.W. Zeng, K.Y. Tham, M. Badgero, and J. Weng, "Dav: A Humanoid Robot Platform for Autonomous Mental Development," in Proc. IEEE 2nd International Conference on Development and Learning (ICDL'02), Cambridge, MA, pp. 73-81, June 12- 15, 2002.
199. N. Zhang, J. Weng and X. Huang, "Progress in Outdoor Navigation by the SAIL Developmental Robot," in Proc. SPIE Int'l Symposium on Intelligent Systems and Advanced Manufacturing, vol. 4573, Newton, MA, Oct. 28 - Nov. 2, 2001.

200. W. S. Hwang and J. Weng, "Incremental Hierarchical Discriminating Regression for Indoor Visual Navigation," in Proc. IEEE Int'l Conf. on Image Processing, Thessaloniki, Greece, Oct. 7-10, 2001.
201. Y. Zhang and J. Weng, "Autonomous Speech Acquisition of a Robot," in Proc. IEEE International Conference on Systems, Man, and Cybernetics (SMC 2001), Tucson, AZ, pp. 524-529, October 7-10, 2001.
202. J. Weng and W. S. Hwang, "Incremental Hierarchical Discriminant Regression for Online Image Classification," in Proc. IEEE Int'l Conf. on Document Analysis and Recognition, Seattle, WA, pp. 476- 480, Sept. 10 - 13, 2001.
203. Y. Zhang and J. Weng, "Developing Auditory Skills By the SAIL Robot," in Proc. Int'l Symposium on Computational Intelligence for Robotics and Automation, IEEE Int'l Sym. Computational Intelligence in Robotics and Automation (IEEE CIRA 2001), Banff, Alberta, CA, pp. 155 - 160, July 29 - Aug. 1, 2001.
204. Y. Zhang and J. Weng, "Grounded Auditory Development by a developmental robot," In Proc. INNS-IEEE International Joint Conference on Neural Networks (IJCNN 2001), Washington DC, pp. 1059-1064, July 14-19, 2001.
205. J. Weng, Y. Zhang and W. S. Hwang, "Teaching a Learning Vehicle - A Developmental Perspective," **invited paper**, in Proc. Robotics and Mechatronics Congress (RMC 2001), Singapore, June 6 - 8, 2001.
206. W. S. Hwang and J. Weng "An Incremental Algorithm for Vision Guided Navigation," **invited paper**, in Proc. Robotics and Mechatronics Congress, Singapore (RMC 2001), June 6 - 8, 2001.
207. W. S. Hwang and J. Weng, "Hierarchical Discriminant Regression for Incremental and Real-Time Image Classification," 2nd International Conf. on Intelligent Data Engineering and Automated Learning, Hong Kong, Dec. 13 - 15, 2000.
208. W. S. Hwang and J. Weng, "An Online Training and Online Testing Algorithm for OCR and Image Orientation Classification Using Hierarchical Discriminant Regression," The forth IAPR International Workshop on Document Analysis Systems, Rio de Janeiro, Brazil, Dec. 10 - 13, 2000.
209. J. Weng, W. S. Hwang, Y. Zhang, C. Yang and R. Smith, "Developmental Humanoids: Humanoids that Develop Skills Automatically," in Proc. First IEEE Conf. on Humanoid Robots, Cambridge, MA, Sept. 7 - 8, 2000.
210. J. Weng, "Autonomous Mental Development and Performance Metrics for Intelligent Systems," in Proc. on Performance Metrics for Intelligent Systems Workshop, Gaithersburg, MD, pp. 349- 359, August 14 - 16, 2000.
211. J. Weng, W. S. Hwang, C. H. Evans, Y. Zhang, S. Chen, J. Q. Sperber, C. Yang, G. J. Bloy, M. K. Krishnaswamy, F. -I. Liu, R. J. Smith, and J. A. Kohler, "Developmental Humanoids: Humanoids that Develop Skills Automatically," in Proc. NSF/DARPA Workshop on Development and Learning, Michigan State University, East Lansing, MI, pp. 123- 132, April 5-7, 2000.
212. J. Weng, C. H. Evans and W. S. Hwang, "An Incremental Learning Method for Face Recognition under Continuous Video Stream," Fourth International Conference on Automatic Face and Gesture Recognition, Grenoble, France. March 28 - 30, 2000.
213. J. Weng and W. S. Hwang, "An incremental learning algorithm with automatically derived discriminating features," Asian Conference on Computer Vision, Taipei, Taiwan, pp. 426 - 431, Jan. 8 - 9, 2000.

214. J. Weng, W. S. Hwang, Y. Zhang and C. Evans, "Developmental robots: Theory, Method and Experimental Results," in *Proc. 2nd Int'l Symposium on Humanoid Robots*, Tokyo, Japan, pp. 57- 64, Oct. 8- 9, 1999.
215. W. S. Hwang and J. Weng, M. Fang and J. Qian, "A fast image retrieval algorithm with automatically extracted discriminant features," in *Proc. IEEE Workshop on Content-based Access of Image and Video Libraries*, Fort Collins, Colorado, pp. 8 - 15, June 22, 1999.
216. P. McKinley, B. Cheng and J. Weng, "Moving industry-guided multimedia technology into the classroom," in *Proc. of the 30th ACM SIGCSE Technical Symposium on Computer Science Education*, New Orleans, Louisiana, pp. 160 - 164, March 24-28, 1999.
217. J. Weng, C. H. Evans and W. S. Huang, "Automated animal-Like learning for developing a face recognition system," in *Proc. 2nd Int'l Conf. on Audio and Visual-Based Person Authentication*, Washington, DC, pp. 49 - 54, March 22-24, 1999.
218. J. Weng, Y. B. Lee and C. H. Evans, "The developmental approach to multimedia speech learning," in *Proc. IEEE Int'l Conf. on Acoustics, Speech, and Signal Processing*, Phoenix, Arizona, vol. 6, pp. 3093 - 3096, March 15 - 19, 1999.
219. J. Weng, C. H. Colin and W. S. Hwang, "Modeling Developmental Learning," in *Proc. 1st International Seminar on Bioelectronic Interfaces and 3rd International Workshop on Cybernetic Vision*, Campinas, Brazil, pp. 115 - 120, Feb. 23-26, 1999.
220. J. Weng, C. Evans, W. S. Hwang, and Y. B. Lee, "The Developmental Approach to Artificial Intelligence: Concepts, Developmental Algorithms and Experimental Results" in *Proc. NSF Design & Manufacturing Grantees Conference*, Long Beach, CA, Jan. 5-8, 1999.
221. J. Weng and W. S. Hwang, "Sensorimotor action sequence learning with applications to face recognition and discourse," in *Proc. Int'l Conf. Pattern Recognition*, August 16-20, Brisbane, Australia, pp. 252-254, 1998.
222. S. Y. Chen and J. Weng, "State-based SHOSLIF for indoor visual navigation," in *Proc. Int'l Conf. Pattern Recognition*, August 16-20, Brisbane, Australia, pp. 482-484, 1998.
223. J. Weng and W. S. Hwang, "A Mechanism for Multisensory Fusion Using Temporal Context," *Proc. 1998 International Conference on Multisource-Multisensor Data Fusion (FUSION'98)*, Las Vegas, Nevada, vol. II, pp. 618-625, July 6-9, 1998.
224. J. Weng, "The role of Learning," **invited** position paper in *Proc. 1998 AAAI Spring Symposium Series, Integrating Robotic Research: Taking The Next Leap*, Stanford University, March 23-25, 1998.
225. J. Weng, "The Developmental Approach to Intelligent Robots," in *Proc. 1998 AAAI Spring Symposium Series, Integrating Robotic Research: Taking The Next Leap*, Stanford University, March 23-25, 1998.
226. J. Weng and W. S. Hwang, "Toward automation of learning: The state self-organization problem for a face recognizer," in *Proc. 3rd International Conference on Automatic Face- and Gesture-Recognition*, Nara, Japan, pp. 384 - 389, April 14-16, 1998.
227. K. Y. Guentchev and J. Weng, "Learning-based three-dimensional sound localization using a compact-coplanar array of microphones," in *Proc. 1998 AAAI Spring Symposium Series, Intelligent Environments Symposium*, Stanford University, March 23-25, 1998.

228. W. S. Hwang and J. Weng, "Autonomous vision-guided robot manipulation control," in *Proc. Third Asian Conference on Computer Vision*, vol. II, pp. 503-510, Hong Kong, January 8 - 11, 1998.
229. L. Tummala and R. Mukherjee and D. Aslam and N. Xi and S. Mahadevan and J. Weng, "Reconfigurable adaptable micro-robot," in *Proc. 1999 IEEE International Conference on Systems, Man, and Cybernetics, Human Communication and Cybernetics*, vol. VI, Tokyo, Japan, pp. 687-691, 1999.
230. W. S. Hwang and J. Weng, "Autonomous learning for visual attention selection," in *Proc. Int'l Conf. Vision, Recognition, Action: Neural Models of Mind and Machine*, Boston University, p. 54, May 29-31, 1997.
231. S. Y. Chen and J. Weng, "On-line incremental learning for vision-based real-time navigation using improved updating," in *Proc. 10th Scandinavian Conf. on Image Analysis*, Lappeenranta, Finland, pp. 977-984, June 9-11, 1997.
232. W. S. Hwang and J. Weng, "Vision-guided robot manipulator control as learning and recall using SHOSLIF," in *Proc. IEEE Int'l Conf. on Robotics and Automation*, Albuquerque, NM, pp. 2862-2867, April 20-25, 1997.
233. D. Swets and J. Weng, "Discriminant Analysis and Eigenspace Partition Tree for Face and Object Recognition from Views," in *Proc. 2nd International Conference on Automatic Face- and Gesture-Recognition*, October 14-16 Killington, Vermont, pp. 192-197, 1996.
234. Y. Cui and J. Weng, "Hand Sign Recognition from Intensity Image Sequences with Complex Backgrounds," in *Proc. 2nd International Conference on Automatic Face- and Gesture-Recognition*, October 14-16 Killington, Vermont, pp. 259-264, 1996.
235. J. Weng, "Sensing, Control, Intelligence and Learning," in *Proc. IEEE Workshop on Architectures or Mathematics: What Determines the Design of Intelligent Systems*, Dearborn, MI, September 19, 1996.
236. J. Weng and S. Y. Chen "Incremental learning for vision-based navigation," in *Proc. International Conference on Pattern Recognition*, Vienna, Austria, vol. IV, pp. 45- 49, Aug. 25-30, 1996.
237. Y. Cui and J. Weng, "View-based hand segmentation and hand-sequence recognition with complex backgrounds," in *Proc. International Conference on Pattern Recognition*, Vienna, Austria, vol. III, pp. 617-621, Aug. 1996.
238. W. S. Hwang, S. J. Howden and J. Weng, "Performing temporal action with a hand-eye system using the SHOSLIF approach," in *Proc. International Conference on Pattern Recognition*, Vienna, Austria, vol. IV, pp. 35-39, Aug. 1996.
239. Y. Cui and J. Weng, "Hand segmentation using learning-based prediction and verification for hand sign recognition," in *Proc. IEEE Conference on Computer Vision and Pattern Recognition*, San Francisco, CA, pp. 88-93, June, 1996.
240. D. Swets and J. Weng, "The self-organizing hierarchical optimal subspace learning and inference framework for object recognition," in *Proc. Int'l Conf. Neural Networks and Signal Processing*, Nanjing, China, Dec. 10-13, 1995.
241. Y. Cui and J. Weng, "Learning-based object segmentation for fovea images," in *2nd Asian Conf. on Computer Vision*, pp. 71-75, Singapore, Dec. 5-8, 1995.
242. D. L. Swets and J. Weng, "Image-based recognition using learning for generalizing parameters," in *Proc. 2nd Asian Conf. on Computer Vision*, Singapore, Dec. 5-8, 1995.

243. S. Y. Chen and J. Weng, "Vision-based navigation using self-organizing learning," in *Proc. 2nd Asian Conf. on Computer Vision*, Singapore, pp. 239-243, Dec. 5-8, 1995.
244. D. L. Swets and J. Weng, "Efficient content-based image retrieval using automatic feature selection," in *Proc. IEEE Int'l Symposium on Computer Vision*, Coral Gables, FL, pp. 85-90, Nov. 20-22, 1995.
245. Y. Cui and J. Weng, "2D object segmentation from fovea images based on eigen-subspace learning," in *Proc. IEEE Int'l Symposium on Computer Vision*, Coral Gables, FL, pp. 305-310, Nov. 20-22, 1995.
246. J. Weng and S. Y. Chen, "Autonomous navigation through case-based learning," in *Proc. IEEE Int'l Symposium on Computer Vision*, Coral Gables, FL, pp. 359-364, Nov. 20-22, 1995.
247. D. Swets and J. Weng, "Efficient image retrieval using a network with complex neurons," **invited** paper, in *Proc. IEEE Int'l Conf. on Neural Networks*, Perth, Australia, Nov. 27 - Dec 1, 1995.
248. J. Weng, "SHOSLIF: A framework for sensor-based learning for high-dimensional complex systems," **invited** paper in *Proc. IEEE Workshop on Architectures for Semiotic Modeling and situation analysis in Large Complex Systems*, Monterey, CA, pp. 303-313, Aug. 27-29, 1995.
249. S. Y. Chen and J. Weng, "Autonomous navigation using recursive partition tree," in *Proc. Workshop on Vision for Robots*, Pittsburgh, PA, pp. 130-135, Aug. 7-9, 1995.
250. D. Swets, B. Punch, and J. Weng, "Genetic algorithm for object recognition in a complex scene," in *Proc. Int'l Conf. on Image Processing*, Washington, D.C., October 22-25, vol. II, pp. 595-598, 1995.
251. G. Stockman and J. Weng, "Coursework in image computation for undergraduates," in *Proc. Int'l Conf. on Image Processing*, Washington, D.C., October 22-25, vol. II, pp. 315-318, 1995.
252. Y. Cui, J. Weng and H. Reynolds, "Optimal parameter estimation of ellipses," in *Proc. Int'l Conf. on Image Analysis and Processing*, San Remo, Italy, pp. 471-476, Sept. 13-15, 1995.
253. Y. Cui, D. Swets and J. Weng, "Learning-based hand sign recognition using SHOSLIF-M," in *Proc. 5th Int'l Conf. Computer Vision*, Cambridge, MA, pp. 631-636, June 20-23, 1995.
254. Y. Cui and J. Weng, "Learning-based hand sign recognition," in *Proc. Int'l Workshop on Automatic Face- and Gesture-Recognition*, Zurich, Switzerland, pp. 201-206, June 26-28, 1995.
255. J. Weng, "SHOSLIF: A Learning System for Vision and Control," **invited** paper in *Proc. IEEE Annual Workshop on Architectures for Intelligent Control Systems*, Columbus, Ohio, August 16, 1994.
256. J. Weng, "SHOSLIF: A framework for object recognition from images," **invited** paper in *Proc. IEEE International Conference on Neural Networks*, Orlando, FL, pp. 4204-4209, June 28 - July 2, 1994.
257. J. Weng, "On comprehensive visual learning," **invited** paper in *Proc. NSF/ARPA Workshop on Performance vs. Methodology in Computer Vision*, Seattle, WA, pp. 152-166, June 24-25, 1994.
258. S. Y. Chen and J. Weng, "Calibration for peripheral attenuation in intensity images," in *Proc. First IEEE International Conference on Image Processing*, Austin, Texas, pp. 992-996, Nov. 13-16, 1994.
259. C. Dorai, J. Weng and A. K. Jain, "Optimal registration of multiple range views," in *Proc. International Conference on Pattern Recognition*, Jerusalem, Israel, vol. I, pp. 569-571, Oct. 9-13, 1994.

260. D. Judd, N. Ratha, P. K. McKinley, J. Weng, and A. K. Jain, "Implementation of parallel vision algorithms on workstation clusters," in Proc. *International Conference on Pattern Recognition*, Jerusalem, Israel, pp. 317-321, Oct. 9-13, 1994.
261. J. Weng, Y. Cui, N. Ahuja and A. Singh, "Integration of Transitory Image Sequences," in Proc. *IEEE Conf. Computer Vision and Pattern Recognition*, Seattle, Washington, pp. 966-969, June 20-23, 1994.
262. J. Weng, A. Singh, and M. Y. Chiu, "Learning-based ventricle detection from cardiac MR and CT images," in Proc. *IEEE Workshop on Biomedical Image Analysis*, Seattle, Washington, pp. 23-32, June 24-25, 1994.
263. J. Weng, "Generalization of hierarchical retinotopic networks using stochastic distortion models," in Proc. *1994 International Symposium on Speech, Image Processing & Neural Networks*, Hong Kong, pp. 381-384, April 14-16, 1994.
264. J. Weng, A. Singh, and M. Y. Chiu, "Fully automatic ventricle detection from cardiac MR images using machine learning," in Proc. *SPIE Medical Imaging 1994*, Newport Beach, CA, pp. 40-51, Feb. 1994.
265. J. Weng, "A Self-Organizing Approach to Object Recognition," in Proc. *International Symposium of Young Investigators on Information, Computers and Control*, Beijing, China, Feb. 2-4, 1994.
266. J. Weng, "On the structure of retinotopic hierarchical networks," in Proc. *World Congress on Neural Networks*, Portland, Oregon, July 1993, vol. 4, pp. 148-153.
267. J. Weng, N. Ahuja and T. S. Huang, "Learning recognition and segmentation of 3-D objects from 2-D images," in Proc. *4th International Conf. Computer Vision*, Berlin, Germany, pp. 121-128, May, 1993.
268. J. Weng, T. S. Huang and N. Ahuja, "3-D object recognition from images: A neural network approach," in Proc. *2nd Singapore International Conference on Image Processing*, Singapore, September 1992.
269. J. Weng and T. S. Huang, "Complete motion and structure from two monocular sequences without stereo correspondence," in Proc. *International Conference on Pattern Recognition*, The Hague, The Netherlands, Aug. 1992, pp. 651-654.
270. J. Weng, N. Ahuja and T. S. Huang, "Cresceptron: a self-organizing neural network which grows adaptively," in Proc. *International Joint Conference on Neural Networks*, Baltimore, Maryland, June, 1992, vol. I, pp. 576-581.
271. J. Weng, "Signal reconstruction from windowed Fourier phase," in Proc. *International Conference on Acoustics, Speech, and Signal Processing*, San Francisco, CA, vol. 4, pp. 145-148, March 1992.
272. J. Zhong, J. Weng and T. S. Huang, "Robust and physically-constrained interpolation of fluid flow fields", in Proc. *International Conference on Acoustics, Speech, and Signal Processing*, San Francisco, CA, vol. 3, pp. 185-188, March 1992.
273. N. Cui, J. Weng and P. Cohen, "Motion and structure from long stereo image sequences," in Proc. *IEEE Workshop on Visual Motion*, Princeton, New Jersey, pp. 75-80, Oct. 1991.
274. P. Cohen and J. Weng, "Estimation of ground structure and aircraft motion from aerial image sequences," in Proc. *Canadian Conference on Electrical and Computer Engineering*, Quebec City, Quebec, Canada, Sept. 1991.
275. J. Weng, "On the completeness of windowed Fourier phase used for image matching," in Proc. *IAPR 6th International Conference on Image Analysis and Processing*, Como, Italy, Sept. 1991, pp. 139-146.

276. N. Cui, J. Weng and P. Cohen, "Dynamic stereo with visual integration for sensory motion and environmental reconstruction," in *Proc. International Advanced Robotics Programme: Second Workshop on Sensor Fusion and Environmental Modeling*, Oxford, UK, Sept. 1991.
277. J. Weng, "Motion analysis and constrained least-squares matrix fitting," in *Proc. IAPR 6th International Conference on Image Analysis and Processing*, Como, Italy, Sept. 1991, pp. 277-281.
278. J. Weng, "High-level and low-level issues in dynamic scene analysis," in *Proc. 12th International Joint Conference on Artificial Intelligence: Workshop on Dynamic Scene Understanding*, Sydney, Australia, Aug. 1991.
279. M. Audette, P. Cohen and J. Weng, "Shading based two-view matching," in *Proc. 12th International Joint Conference on Artificial Intelligence*, Sydney, Australia, pp. 1286-1291, Aug. 1991.
280. J. Zhong, J. Weng and T. S. Huang, "Vector field interpolation in fluid flow," in *Proc. 1991 International Conference on Digital Signal Processing*, Florence, Italy, Sept. 1991.
281. J. Weng, "A theory of image matching," (a long paper) in *Proc. Third International Conference on Computer Vision*, Osaka, Japan, pp. 200-209, Dec. 1990.
282. N. Cui, J. Weng, and P. Cohen, "Extended structure and motion analysis from monocular image sequences," (a long paper) in *Proc. Third International Conference on Computer Vision*, Osaka, Japan, pp. 222-229, Dec. 1990.
283. J. Weng, and P. Cohen, "Fusion of stereo-views: estimating structure and motion using a robust method," in *Proc. SPIE Symposium on Advances in Intelligent Systems*, Boston, MA, Nov. 1990.
284. J. Weng, and P. Cohen, "Robust motion estimation using stereo vision," in *Proc. IEEE International Workshop on Robust Computer Vision*, Seattle, WA, pp. 367-388, Oct. 1990.
285. J. Weng and P. Cohen, "Recursive-batch estimation of structure and motion from stereo image sequences," in *Proc. 1990 Canadian conference on electrical and computer engineering*, Sept. 1990.
286. J. Weng and P. Cohen and M. Herniou, "Stereo camera calibration with nonlinear corrections," in *Proc. Tenth International Conference on Pattern Recognition*, Atlantic City, New Jersey, pp. 246-253, June 1990.
287. J. Weng, T. S. Huang and N. Ahuja, "Motion and structure estimation from line matches: performance obtained and beyond," in *Proc. Tenth International Conference on Pattern Recognition*, Atlantic City, New Jersey, pp. 168-172, June 1990.
288. J. Weng, P. Cohen and N. Rebibo, "Fusion of stereo views in long image sequences," in *Proc. First International Workshop on Multi-Sensor Fusion and Environment Modeling*, Toulouse, France, Oct. 1989.
289. J. Weng and F. Vicuna, "Extracting lines and corner points of light strips from images," in *Proc. IEE 1989 International Symposium on Computer Architecture and Digital Signal Processing*, Hong Kong, pp. 450-455, Oct. 1989.
290. J. Weng and P. Cohen, "An approach to passive navigation, in *Proc. the Second Workshop on Military Robotic Applications*," Kingston, pp. 57-65, Aug. 1989.
291. J. Weng, N. Ahuja, and T. S. Huang, "Optimal motion and structure estimation," in *Proc. IEEE Conference on Computer Vision and Pattern Recognition*, San Diego, CA, pp. 144-152, June, 1989.

292. J. Weng, T. S. Huang and N. Ahuja, "Motion from images: image matching, parameter estimation and intrinsic stability," in *Proc. IEEE Workshop on Visual Motion*, Irvine, CA, pp. 359-366, March 1989.
293. J. Weng, N. Ahuja, and T. S. Huang, "Two-view matching," (a long paper) in *Proc. Second International Conference on Computer Vision*, Florida, pp. 64-73, Dec. 1988.
294. J. Weng, Y. C. Liu, T. S. Huang, and N. Ahuja, "Estimating motion/structure from line correspondences: a robust linear algorithm and uniqueness theorems," in *Proc. IEEE Conf. Computer Vision and Pattern Recognition*, Ann Arbor, Michigan, pp. 387-392, June 1988.
295. J. Weng, N. Ahuja, and T. S. Huang, "Closed-form solution + maximum likelihood: a robust approach to motion and structure estimation," in *Proc. IEEE Conference on Computer Vision and Pattern Recognition*, Ann Arbor, Michigan, pp. 381-386, June 1988.
296. J. Weng, T. S. Huang, and N. Ahuja, "A two-step approach to optimal motion and structure estimation," in *Proc. IEEE Workshop on Computer Vision*, Miami, FL. pp. 355-357, Nov. 1987.
297. J. Weng, T. S. Huang, and N. Ahuja, "Error analysis of motion parameter determination from image sequences," in *Proc. First International Conference on Computer Vision*, London, England, pp. 703-707, June 1987.
298. J. Weng, N. Ahuja, and T. S. Huang, "Motion modeling and prediction, in *Proc. the Eighth International Conference on Pattern Recognition*," Paris, France, pp. 1107-1109, Oct. 1986.
299. T. S. Huang, J. Weng, and N. Ahuja, "3-D motion from image sequences: modeling, understanding and prediction," in *Proc. IEEE Workshop on Motion: Representation and Analysis*, Charleston, South Carolina, May 1986.
300. J. Weng, and N. Ahuja, "Octree representation of objects in arbitrary motion," in *Proc. IEEE Conference on Computer Vision and Pattern Recognition*, San Francisco, CA, pp. 524-529, June 1985.

Chapters in Edited Books

301. J. Weng, Juan Castro-Garcia, Zejia Zheng and Xiang Wu, "Task-Nonspecific and Modality-Nonspecific AI," in A. Zeng, D. Pan, T. Hao, D. Zhang, Y. Shi and X. Song (eds.), *Human Brain and Artificial Intelligence*, ISBN 978-981-15-1398-5, pp.133-150, Springer, New York, 2019.
302. X. Huang, J. Weng, and Z. Zhang, "Developmental Learning for User Activities," in N. Kasabov (ed.) *Springer Handbook of Bio-Neuroinformatics*, Springer, New York, NY, pp. 1057-1070, ISBN 978-3-642-30573-3, 2014.
303. Z. Ji, J. Weng, and D. Prokhorov, "Autonomous Visuomotor Development for Neuromorphic Robots," in J. L. Krichmar and H. Wagatsuma (eds.) *Neuromorphic and Brain-Inspired Robots*, Cambridge University Press, Cambridge, pp. 156-177, ISBN 978-0-521-76878-8, 2011.
304. J. Weng, "Brain-Like Temporal Processing", in Y. Meng and Y. Jin (eds.) *Bio-Inspired Self-Organizing Robotic Systems*, Springer-Verlag, Berlin Heidelberg, pp. 196-212, ISBN 978-3-642-20759-4, 2011.
305. J. Weng, "Autonomous Mental Development," in B. M. Wilamowski and J. D. Irwin (eds.) *The Industrial Electronics Handbook*, 2nd edition, CRC Press, New York, NY, pp. 31-1 to 31-17, ISBN 978-1-4398-0283-0, 2011.

306. J. Weng, T. Luwang, H. Lu, and X. Xue, "Cortex Inspired In-place Learning Networks for General Invariance and Multi-Tasks," in Taisho Matsuda (ed.), *Robot Vision: New Research*, Nova Science Publishers, Hauppauge, pp. 1-24, ISBN 978-1-60456-984-1, 2009.
307. J. Weng, W.S. Hwang, Y. Zhang, "Autonomous Mental Development by Robots: Vision, Audition, and Behaviors," in C.T. Leondes (ed.) *Intelligence Systems: Techniques and Applications*, CRC Press, Boca Raton, FL, Vol. 1, pp. 355-380, 2002.
308. J. Weng, W. S. Hwang and Y. Zhang, "Developmental Vision, Audition, Robots and Beyond," in A. C. Bovik, C. W. Chen and D. Goldgof (eds.) *Advances in Image Processing and Understanding*, World Scientific Press, New York, NY, pp. 1-37, 2002.
309. J. Weng, "Learning in Computer Vision and Beyond: Development," in C. W. Chen and Y. Q. Zhang (eds.), *Visual Communication and Image Processing*, Marcel Dekker Publisher, New York, NY, pp. 431 - 487, 1999.
310. J. Weng and D. L. Swets, "Face Recognition," in A. K. Jain, R. Bolle (eds.), *Biometrics: Personal Identification in Networked Society*, Kluwer Academic Press, Hingham, MA, pp. 65 - 86, 1999.
311. W. Zhao, A. Krishnaawamy, R. Chellapa, D. Swets and J. Weng, "Discriminant Analysis of Principal Components for Face Recognition," in H. Wechsler, P. J. Phillips, V. Bruce, F. F. Soulie and T. S. Huang, *Face Recognition: From Theory to Applications*, pp. 73-85, Springer-Verlag, Berlin, 1998.
312. J. Weng and Y. Cui, "Recognition of Hand Signs from Complex Backgrounds," in R. Cipolla and A. Pentland (eds.), *Computer Vision for Human-Machine Interactions*, Cambridge University Press, pp. 235 - 265, 1998.
313. J. Weng, "Cresceptron and SHOSLIF: Toward comprehensive visual learning," in S. K. Nayar and T. Poggio (eds.), *Early Visual Learning*, Oxford University Press, New York, pp. 183-214, 1996.
314. J. Weng, S. Y. Chen and T. S. Huang, "Visual navigation using fast content-based retrieval," in Y. Aloimonos (ed.), *Visual Navigation: From Biological Systems to Unmanned Ground Vehicles*, Lawrence Erlbaum, New Jersey, pp. 178-217, 1997.
315. J. Weng and T. S. Huang, "3-D motion analysis from image sequences using point correspondences," in C. H. Chen, L. F. Pau and P. S. Wang (eds.), *Handbook of Pattern Recognition and Computer Vision*, World Scientific Publishing, pp. 395- 441, 1993.

Abstracts in Refereed Conference or Workshop Proceedings

316. Z. Zheng, K. Qian, J. Weng, and Z. Zhang, "Motor Neuron Splitter for Efficient Learning in Where-What Network," International Conference on Brain-Mind, July 14-15, East Lansing, Michigan, USA, p. 40, 2013.
317. H. Ye, X. Huang, and J. Weng, "How Does a Brain-Inspired Developmental Network Deal with Inconsistent Training?," Brain-Mind Workshop, Fudan University, China, Dec. 15-16, 2012.
318. Y. Wang, X. Wu, and J. Weng, "Brain-Inspired Where-What Visual Network 7: Deal with Object Scales," Brain-Mind Workshop, Fudan University, China, Dec. 15-16, 2012.
319. M. Solgi, T. Liu, and J. Weng, "A Computational Developmental Model for Specificity and Transfer in Perceptual Learning," International Conference on Brain-Mind, July 14-15, East Lansing, Michigan, USA, p. 65, 2012.

320. S. Lawawirojwong, T. Suepa, J. Qi, P. Cornwell, and J. Weng, "Developmental Networks with Classification Uncertainty," International Conference on Brain-Mind, July 14-15, East Lansing, Michigan, USA, p. 66, 2012.
321. X. Song, W. Zhang, and J. Weng, "A Network Model for Multiple Object Scales in Cluttered Backgrounds: Multiple Patches per Object," International Conference on Brain-Mind, July 14-15, East Lansing, Michigan, USA, p. 68, 2012.
322. M. Solgi, T. Liu, and J. Weng, "A Computational Model for Perceptual Learning: its Specificity and Transfer," Midwest Cognitive Science Meeting, Kellogg Center, East Lansing MI, April 16, 2011.
323. M. D. Luciw and J. Weng, "The effects of top-down connections in computational multilayer two-way Hebbian networks: Abstract representation and temporal context," Society for Neuroscience, Chicago, Oct. 17-21, 2009.
324. M. Luciw and J. Weng, "A model with energy, plasticity schedule and age for neuronal in-place adaptation," Society for Neuroscience, San Diego, CA, November 3-7, 2007.
325. J. Weng, T. Luwang, M. Luciw, W. Shi, H. Lu, M. Chi, X. Xue, "The Multilayer In-Place Learning Networks for General Invariance," Society for Neuroscience, San Diego, CA, November 3-7, 2007.
326. J. Weng, "A direct solution to matrix least-squares fitting with constrained singular values," *Second SIAM Conf. on Linear Algebra in Signals, Systems, and Control*, Cathedral Hill Hotel, San Francisco, CA, Nov. 5-9, 1990.

arXiv Reports

327. J. Weng, Conscious Intelligence Requires Lifelong Autonomous Programming For General Purposes, arXiv: arXiv:2007.00001, 16 pages, 6 figures, submitted to arXiv June 30, 2020. This work was submitted to *Science* May 27, 2020 and to *Nature* June 9, 2020, both rejected.
328. J. Weng, A Model for Auto-Programming for General Purposes, arXiv:1810.05764, 22 pages, June 13, 2017, submitted to arXiv Oct. 12, 2018. Also Technical Report MSU-CSE-2015-13, 2015. The material presented in this report was rejected by *Nature* June 2017, *Science* January 2018, and *Science China* July, 2018.

Other Journal Publications

329. J. Weng, "Insufficiently Informed by Artificial Intelligence," *Science* (eLetter), April 8, 2019.
330. J. Weng, "Brain Stories 7: What Fudan Owes Us", *Brain-Mind Magazine*, vol. 6, no. 2, pp. 7-9, 2017, authored under pen name B. N. Huang.
331. J. Weng, "Why Is the AI Community Mised?", *Brain-Mind Magazine*, vol. 6, no. 2, pp. 1-3, 2017.
332. J. Weng, "My Overseas-Chinese Neighbors", *Brain-Mind Magazine*, vol. 6, no. 1, pp. 7-8, 2017, authored under pen name B. N. Huang.
333. J. Weng, "Brains are Automata: This is not just AI and Robotics," *Brain-Mind Magazine*, vol. 4, no. 1, pp. 10-13, 2015.

334. J. Weng, "Consciousness for a Social Robot is Not Piecemeal," *IEEE CIS Autonomous Mental Development Newsletter*, vol. 12, no. 1, pp. 10-11, 2015.
335. J. Weng, "My Ten Years of Misfortune at Fudan University: Trying to Improve the Research Environment," *Brain-Mind Magazine*, vol. 3, no. 2, pp. 12-14, 2014.
336. J. Weng, "Expose a Closed Letter to Hu Jintao: Break up CCP like the Bell System in U.S.?" *Brain-Mind Magazine*, vol. 3, no. 2, pp. 9-11, 2014.
337. J. Weng, "The Open Letter to Chairman Xi: Your First Challenge is the Constitution (2)", *Brain-Mind Magazine*, vol. 3, no. 2, pp. 5-8, 2014.
338. J. Weng, "Brain Stories 5: Visit to Cambodia in Contrast with Thailand," *Brain-Mind Magazine*, vol. 3, no. 2, pp. 1-4, 2014, authored under pen name B. N. Huang.
339. J. Weng, "Cross-Disciplinary Training is as Urgent for Advisers as for Students," *IEEE CIS Autonomous Mental Development Newsletter*, vol. 11, no. 2, pp. 9-10, 2014.
340. J. Weng, "The 5th Open Letter to the U.S. President Obama: Bombing ISIS is a Strategic Mistake," *Brain-Mind Magazine*, vol. 3, no. 1, pp. 8-9, 2014.
341. J. Weng, "The Open Letter to Chairman Xi: Your First Challenge is the Constitution (1)", *Brain-Mind Magazine*, vol. 3, no. 1, pp. 5-7, 2014.
342. J. Weng, "Brain Stories 4: Government Terrors," *Brain-Mind Magazine*, vol. 2, no. 2, pp. 18-20, 2013, authored under pen name B. N. Huang.
343. J. Weng, "The 4th Open Letter to the U.S. President Obama: Safeguard U.S. against Instinct Bursts", *Brain-Mind Magazine*, vol. 2, no. 2, pp. 13-15, 2013.
344. J. Weng, "How MSU Lacks Due Process: A Bylaw Perspective," *Brain-Mind Magazine*, vol. 2, no. 2, pp. 11-12, 2013, authored under pen name C. S. Masfis.
345. J. Weng, "How the Brain-Mind Works: A Two-Page Introduction to a Theory", *Brain-Mind Magazine*, vol. 2, no. 2, pp. 1-3, 2013.
346. J. Weng, "The 3rd Open Letter to the US President Obama: Why Government Ideologies Block Knowledge?", *Brain-Mind Magazine*, vol. 2, no. 1, pp. 22-24, 2013.
347. J. Weng, "Brain Stories 3: Bitter Science," *Brain-Mind Magazine*, vol. 2, no. 1, pp. 18-21, 2013, authored under pen name B. N. Huang.
348. J. Weng, "Every Country should Self-Organize like a Brain: Rebuttal to D. W. Mabaho," *Brain-Mind Magazine*, vol. 2, no. 1, pp. 8-11, 2013.
349. J. Weng, "The 2nd Open Letter to the US President Obama: Why US Should Be Friendly with Every Government?", *Brain-Mind Magazine*, vol. 1, no. 2, pp. 13-15, 2012.
350. J. Weng, "A Theoretical Proof Bridged the Two AI Schools but a Major AI Journal Desk-Rejected It," *Brain-Mind Magazine*, vol. 1, no. 2, pp. 11-12, 2012, authored under pen name C. S. Masfis.
351. J. Weng, "IEEE TPAMI Banned Neural Network Approaches" *Brain-Mind Magazine*, vol. 1, no. 2, pp. 8-10, 2012, authored under pen name C. S. Masfis.

352. J. Weng, "Brain Stories 2: Bonds and Feuds," *Brain-Mind Magazine*, vol. 1, no. 2, pp. 5-7, 2012, authored under pen name B. N. Huang.
353. J. Weng, "Why Should the CVPR Community See that Output Is Not Only Output?" *Brain-Mind Magazine*, vol. 1, no. 1, pp. 9-10, 2012, authored under pen name C. S. Masfis.
354. J. Weng, "Brain Stories 1: Naivety in Everybody," *Brain-Mind Magazine*, vol. 1, no. 1, pp. 5-6, 2012, authored under pen name B. N. Huang.
355. J. Weng, "Open Letter to the US President Obama: Is the US Foreign Policy Scientifically Shortsighted?," *Brain-Mind Magazine*, vol. 1, no. 1, pp. 3-4, 2012.
356. J. Weng, "Reply and Summary: Modeling AMD and Its Application to Assistive Robotics: Closed Skull or Not?" *IEEE CIS Autonomous Mental Development Newsletter*, vol. 10, no. 1, pp. 10-12, 2012.
357. J. Weng, "Dialog Initiation: Modeling AMD: Closed Skull or Not?," *IEEE CIS Autonomous Mental Development Newsletter*, vol. 9, no. 2, pp. 10-11, 2012.
358. Y. Jin, Y. Meng, J. Weng, and N. Kasabov, "Guest Editorial: Special Issue on Computational Modeling of Neural and Brain Development," *IEEE Transactions on Autonomous Mental Development*, vol. 3, no. 4, pp. 273-275, Dec. 2011.
359. J. Weng, "Through the Symbol-Grounding Problem See the Two Largest Hindrances of Sciences," *IEEE CIS Autonomous Mental Development Newsletter*, vol. 8, no. 1, pp. 10-13, April 2011.
360. J. Weng, "Are natural languages symbolic in the brain?," *IEEE CIS Autonomous Mental Development Newsletter*, vol. 7, no. 2, pp. 10-11, Oct. 2010.
361. J. McClelland, J. Weng, G. De??k and B. Scassellati, "Cognitive Science Meets Autonomous Mental Development," *Cognitive Science*, vol. 34, no. 3, pp. 533-534, April 2010.
362. J. Weng, "AMD Principles: Have We Passed ??Black Art???" *IEEE CIS Autonomous Mental Development Newsletter*, vol. 6, no. 2, pp. 4-5, Oct. 2009.
363. J. Weng and J. McClelland, "Reply and Summary: How the Mind Works Results from How the Brain Develops," *IEEE CIS Autonomous Mental Development Newsletter*, vol. 5, no. 1, pp. 9-11, April 2008.
364. J. Weng and J. McClelland, "Dialog Initiation: How the Mind Works and How the Brain Develops," *IEEE CIS Autonomous Mental Development Newsletter*, vol. 4, no. 2, p. 5, Oct. 2007.
365. J. Weng, "Information from Neuroscience Will Likely Trigger Breakthroughs in Developmental Robotics," *IEEE CIS Autonomous Mental Development Newsletter*, vol. 4, no. 2, p. 4, Oct. 2007.
366. J. McClelland, K. Plunkett and J. Weng, "Convergent Approaches to the Understanding of Autonomous Mental Development," editorial for the Special Issue on Autonomous Mental Development in the *IEEE Transactions on Evolutionary Computation*, vol. 18, no. 2, 2007.
367. J. Weng, "What Does the Biological Brain Tell Us about Development?" *IEEE CIS Autonomous Mental Development Newsletter*, vol. 3, no. 2, pp. 4-5, 2006.
368. J. Weng, "Audition and Language are Tightly Intertwined in Autonomous Development," *IEEE CIS Autonomous Mental Development Newsletter*, vol. 2, no. 2, pp. 3-4, Oct. 2005.

369. J. Weng, "Motivation-free and Motivational Systems," *IEEE CIS Autonomous Mental Development Newsletter*, vol. 2, no. 1, pp. 5-6, April 2005.
370. J. Weng and Y. Zhang, "Reply to replies to 'Dialogue: Object Detection and Object Variance in Autonomous Mental Development'," *IEEE CIS Autonomous Mental Development Newsletter*, vol. 1, no. 2, p. 6, Oct. 2004.
371. J. Weng and Y. Zhang, "Dialogue: Object Detection and Object Variance in Autonomous Mental Development," *IEEE CIS Autonomous Mental Development Newsletter*, vol. 1, no. 2, pp. 1-2, Oct. 2004.
372. J. Weng, "Message from the Chair of the AMD Committee," *IEEE CIS Autonomous Mental Development Newsletter*, vol. 1, no. 1, p. 1, April 2004.

Outreach Posts, not Peer-Reviewed

373. J. Weng, "Machines Develop Consciousness through Autonomous Programming for General Purposes (APFGP)", YouTube video from IJCAI-HBAI talk, 17:17, January 8, 2020.
<https://youtu.be/u5lj15ZR2zU>
374. J. Weng, "BMTalk 3D Episode 8: A Neutral Compromise: Re-Election in Contested States", 6:46, December 22, 2020.
<https://youtu.be/M5faxd1DCr4>
375. J. Weng, "CSE 460 ETM: Emergent Turing Machines", 1:49:45, November 3, 2020.
<https://youtu.be/ReqTKaVvRzI>
376. J. Weng, "CSE 460 EFA Lesson 2: Emergent Finite Automata", 1:14:45, September 29, 2020.
https://youtu.be/bNCWli0d_k
377. J. Weng, "CSE 460 EFA Lesson 1: Emergent Finite Automata", 1:20:24, September 22, 2020.
<https://youtu.be/5NOTH3-PsW8>
378. J. Weng, "Mechanisms of Universal Turing Machines: Vision, Audition, Natural Language, APFGP & Consciousness", YouTube video from IJCNN 2020 Tutorial, 1:40:31, July 21, 2020.
<https://youtu.be/V2kwrJ9ZKVs>
379. J. Weng, "Autonomous Programming for General Purposes: Theory and Experiments", YouTube video from IJCNN 2020 talk, 14:59, July 9, 2020.
https://youtu.be/jI7A_0w_CbU
380. J. Weng, "BMTalk 3D Episode 7: Why Is Eugenics Fraudulent? 'Genius' v. 'Normal' is Not Due to Genes", YouTube video, 38:14, June 19, 2020.
<https://youtu.be/CoMoymfHwJQ>
381. J. Weng, "BMTalk 3D Episode 6: Did Turing Awards Go to Fraud?", YouTube video, 1:03:57, June 4, 2020.
<https://youtu.be/Rz6CFIKrx2k>
382. J. Weng, "BMTalk 3D Episode 5: Did Turing Awards Go to Plagiarism?", YouTube video, 1:05:03, May 27, 2020.
<https://youtu.be/EAhkh79TKFU>

383. J. Weng, "BMTalk 23: Y-to-Y Connections", YouTube video, 27:16, May 23, 2020.
<https://youtu.be/jlnYSJOdy-Y>
384. J. Weng, "Trump: Stop Shooting Yourself in the Foot", YouTube video, 22:35, April 16, 2020.
https://youtu.be/jS_gEW06GC4
385. J. Weng, "Life is Science (36): Did Turing Awards Go to Fraud?", Facebook blog, 13.5 pages, March 8, 2020.
386. J. Weng, "Life is Science (35): Did Turing Awards Go to Plagiarism?", Facebook blog, 8.5 pages, March 4, 2020.
<https://youtu.be/AsT4A-HEWEY>
387. J. Weng, "BMTalk 3D Episode 4: Autonomous Programming for General Purposes (APFGP)," YouTube video, 29:16, July 7, 2019.
388. J. Weng, "NSF Has Failed AI and Natural Intelligence," Facebook blog, 3 pages, July 2, 2019.
<https://www.facebook.com/juyang.weng/posts/10157538091389783>
389. J. Weng, "Review Criteria for Publications, Proposals and Work Reports," Facebook blog, 3 pages, June 19, 2019.
<https://www.facebook.com/juyang.weng/posts/10157503174489783>
390. J. Weng, "All AI Subfields Must Converge as Soon as Possible," Facebook blog, 1 page, June 12, 2019.
<https://www.facebook.com/juyang.weng/posts/10157484849559783>
391. J. Weng, "Life is Science (34): Insufficiently Informed in Artificial Intelligence," Facebook blog, 2 pages, April 7, 2019.
<https://www.facebook.com/juyang.weng/posts/10157311706874783>
392. J. Weng, "Life is Science (33): A Science Perspective Misinterpreted Precise Motor Control," Facebook blog, 2 pages, March 24, 2019.
<https://www.facebook.com/juyang.weng/posts/10157276711684783>
393. J. Weng, "Life is Science (32): Why Embarrassment and Plagiarism in the Science Magazine?" Facebook blog, 4 pages, Feb. 18, 2019.
<https://www.facebook.com/juyang.weng/posts/10157195411589783>
394. J. Weng, "Life is Science (31): Yet Another Embarrassing Article in the Science Magazine," Facebook blog, 3 pages, January 24, 2019.
<https://www.facebook.com/juyang.weng/posts/10157190035549783>
395. J. Weng, "Xi Jinping Has the Keys to End the US-China Trade War," YouTube video, 42:40, Feb. 8, 2019.
<https://youtu.be/8Hk2RV0YNUo>
396. J. Weng, "Life is Science (30): Lack of Science in the Popular Science Magazines," Facebook blog, 3 pages, January 24, 2019.
<https://www.facebook.com/juyang.weng/posts/10157134202129783>
397. J. Weng, "Life is Science (29): Why did Europe Develop Faster than Asia?" Facebook Blog, 5 pages, 10% in English as an introduction, the remaining 90% is in Chinese as a letter to the President Xi Jinping in China, November 24, 2018.
<https://www.facebook.com/juyang.weng/posts/10156987387819783>

398. J. Weng, "70 Years after Alan Turings Machines Thinking Question: A Through Light," Facebook blog, 9 pages, also translated into Chinese on the same site, November 24, 2018.
<https://www.facebook.com/juyang.weng/posts/10156987173879783>
399. J. Weng, "BMTalk 22: Time Delays," YouTube video, 27:49, October 21, 2018.
<https://youtu.be/AtpE39U6URU>
400. J. Weng, "Life is Science (28): Education 2035," Facebook blog, 3 pages, October 8, 2018.
<https://www.facebook.com/juyang.weng/posts/10156877073794783>
401. J. Weng, "BMTalk 21: Limited Fan-in and Fan-out," YouTube video, 26:30, October 7, 2018.
<https://youtu.be/lnI18huKgjQ>
402. J. Weng, "Life is Science (27): What Quality is the Most Important for a University President?," Facebook blog, 2 pages, September 26, 2018.
<https://www.facebook.com/juyang.weng/posts/10156846420489783>
403. J. Weng, "BMTalk 20: Global vs. Local," YouTube video, 26:54, September 21, 2018.
<https://youtu.be/bPEabc89w9w>
404. J. Weng, "Life is Science (26): NSF Should Grasp This Great Opportunity," Facebook blog, 3 pages, September 21, 2018.
<https://www.facebook.com/juyang.weng/posts/10156834171114783>
405. J. Weng, "Life is Science (25): Brains Do Not Code Time," Facebook blog, 3 pages, Sept. 2, 2018.
<https://www.facebook.com/juyang.weng/posts/10156788649904783>
406. J. Weng, "BMTalk 19: Neuron Types," YouTube video, 24:56, August 26, 2018.
<https://youtu.be/7Oyui1oduHY>
407. J. Weng, "BMTalk 18: Hierarchical Optimization," YouTube video, 30:24, August 9, 2018.
<https://youtu.be/UnMnUZJ2yIs>
408. J. Weng, "BMTalk 17: Parameterization," YouTube video, 30:56, July 20, 2018.
<https://youtu.be/d1wQxBzVEGQ>
409. J. Weng, "BMTalk 16: Formulation of Optimization," YouTube video, 24:21, June 29, 2018.
<https://youtu.be/CAfSx0G6VV4>
410. J. Weng, "BMTalk 3D Episode 2: Science Magazine Rejected GENISAMA Super Turing Machines," YouTube video, 31:10, June 28, 2018.
<https://youtu.be/Qf8qjgBMasc>
411. J. Weng, "BMTalk 15: Maximum Likelihood," YouTube video, 24:29, June 22, 2018.
<https://youtu.be/HZLcK1sII28>
412. J. Weng, "BMTalk 14: DN-2 Optimality," YouTube video, 24:30, June 14, 2018.
https://youtu.be/A8Y_zlSjbq8
413. J. Weng, "BMTalk 13: Compare with Others," YouTube video, 24:37, June 7, 2018.
<https://youtu.be/E89gfbCpoDM>

414. J. Weng, "Proof of the Developmental Networks: DN-2," YouTube video, 25:12, May 31, 2018.
<https://youtu.be/Jq8xjag5488>
415. J. Weng, "BMTalk 12: Thinking via Languages," YouTube video, 27:55, May 30, 2018.
<https://youtu.be/WOewwV4a0oE>
416. J. Weng, "Proof of the Developmental Networks: LCA," YouTube video, 2:16:51, May 30, 2018.
<https://youtu.be/vvAuCVGknT8>
417. J. Weng, "Proof of the Developmental Networks: DN-1," YouTube video, 1:54:26, May 27, 2018.
<https://youtu.be/vkH6QZUCSp0>
418. J. Weng, "BMTalk 11: Symbolic vs. Emergent," YouTube video, 28:09, May 24, 2018.
<https://youtu.be/Hwd37z0Lm2Y>
419. J. Weng, "MSUs \$500M Cover-up," Facebook blog, 6 pages, May 20, 2018.
<https://www.facebook.com/juyang.weng/posts/10156512841579783>
420. J. Weng, "BMTalk 10: Knowledge Hierarchy," YouTube video, 28:11, May 17, 2018.
<https://youtu.be/ivODffz7t1s>
421. J. Weng, "BMTalk 9: Thinking: A Toy Problem," YouTube video, 29:49, May 10, 2018.
<https://youtu.be/H7VExmhcU5Q>
422. J. Weng, "BMTalk 8: Thinking," YouTube video, 29:49, May 3, 2018.
<https://youtu.be/R01LlIaMn7A>
423. J. Weng, "BMTalk 7: Dynamic Brain Regions," YouTube video, 29:49, April 26, 2018.
https://youtu.be/atJeX_7w_Ak
424. J. Weng, "NSF Severely Lacks Due Process," Facebook blog, 2 pages, April 20, 2018,
<https://www.facebook.com/juyang.weng/posts/10156441652649783>
425. J. Weng, "BMTalk 6: Declared and Non-declared," YouTube video, 42:00, April 13, 2018.
https://youtu.be/zq8Lu_nSTtU
426. J. Weng, "BMTalk 5: Group from Components," YouTube video, 42:00, April 13, 2018.
https://youtu.be/zq8Lu_nSTtU
427. J. Weng, "BMTalk 4: Task- and Modality-Independences," YouTube video, 23:56, April 5, 2018.
<https://youtu.be/9ieCzUU1yZE>
428. J. Weng, "Decades of Shortsightedness in the U.S. Department of Defense through DARPA," Facebook blog, 4 pages, March 26, 2018,
<https://www.facebook.com/juyang.weng/posts/10156374074319783>
429. J. Weng, "BMTalk 3: Self-Organization," YouTube video, 40:04, March 22, 2018.
<https://youtu.be/0IbGwVztuNY>
430. J. Weng, "BMTalk 2: Developmental Networks," YouTube video, 30:22, March 15, 2018.
<https://youtu.be/K8uNsMDsUlK>

431. J. Weng, "BMTalk 3D Episode 1: Who Has the Intelligent Keys to the North Korea Problem?" YouTube video, 17:45, Feb. 22, 2018. Also a Chinese version 18:44, Feb. 22, 2018.
<https://youtu.be/84kjkZTBz3g>
432. J. Weng, "Life is Science (24): Compare CCP's Strict Disciplines with GOP's Weak Disciplines," Facebook blog, 3 pages, July 8, 2017.
<https://www.facebook.com/juyang.weng/posts/10155595385784783>
433. J. Weng, "Life is Science (23): AlphaGo Addressed a Clean Problem not a Muddy One," Facebook blog, 2 pages, May 28, 2017.
<https://www.facebook.com/juyang.weng/posts/10155445146499783>
434. J. Weng, "Life is Science (22): Disappointed by the Human Brain Project of Henry Markram," Facebook blog, 2 pages, May 21, 2017.
<https://www.facebook.com/juyang.weng/posts/10155420076884783>
435. J. Weng, "Life Is Science (21): Brain Machines (new Chinese and English lyrics need music)," Facebook blog, 1 page, May 13, 2017.
<https://www.facebook.com/juyang.weng/posts/10155390153949783>
436. J. Weng, "Life is science (20): Why was the Chinese Version of Episode 19 "Quietly" Deleted?" Facebook blog, 1 page, May 6, 2017.
<https://www.facebook.com/juyang.weng/posts/10155368361449783>
437. J. Weng, "Life is Science (19): VOA Live Interview with Businessman Guo Wengui Suddenly Cut," Facebook blog, 2 pages, April 23, 2017.
<https://www.facebook.com/juyang.weng/posts/10155325714644783>
438. J. Weng, "Life is Science (18): This Is the Best Option for U.S. and North Korea," Facebook blog, 1 page, April 16, 2017.
<https://www.facebook.com/juyang.weng/posts/10155303216649783>
439. J. Weng, "Life is Science (17): U.S. Strikes on Syria: Trump was Trapped while Xi Watching," Facebook blog, 4 pages, April 9, 2017.
<https://www.facebook.com/juyang.weng/posts/10155277121059783>
440. J. Weng, "Life is Science (16): Legislative Causes in the Contemporary U.S. and China," Facebook blog, 7 pages, April 8, 2017.
<https://www.facebook.com/juyang.weng/posts/10155273710499783>
441. J. Weng, "Life is Science (15): Li Fei-Fei Falsification, AI Trapped and China's Movie Censorship," Facebook blog, 7 pages, March 27, 2017.
<https://www.facebook.com/juyang.weng/posts/10155228743139783>
442. J. Weng, "Life is Science (14): Why There Are No Good Guys and Bad Guys?" Facebook blog, 3 pages, February 26, 2017.
<https://www.facebook.com/juyang.weng/posts/10155133211984783>
443. J. Weng, "Life Is Science (13): Many Deep Convolutional Networks Have Academic Dishonesty?" Facebook blog, 9 pages, February 19, 2017.
<https://www.facebook.com/juyang.weng/posts/10155115304114783>

444. J. Weng, "Life is Science (12): Appeal from the Speech-Banned ScienceNet User," Facebook blog, 3 pages, February 12, 2017.
<https://www.facebook.com/juyang.weng/posts/10155090857804783>
445. J. Weng, "Life is Science (11): Xi Jinping's Absence and Donald Trump's Executive Orders," Facebook blog, 3 pages, January 29, 2017.
<https://www.facebook.com/juyang.weng/posts/10155047430029783>
446. J. Weng, "Life is Science (10): Li Fei-Fei, Plagiarism, and Myopia in AI," Facebook blog, 7 pages, January 24, 2017.
<https://www.facebook.com/juyang.weng/posts/10155025045069783>
447. J. Weng, "Life is Science (9): All Isms Are Shortsighted," Facebook blog, 3 pages, January 15, 2017.
<https://www.facebook.com/juyang.weng/posts/10154995856369783>
448. J. Weng, "Life is Science (8): Non-negotiable?" Facebook blog, 2 pages, January 1, 2017.
<https://www.facebook.com/juyang.weng/posts/10154971108614783>
449. J. Weng, "Life is Science (7): Deng Xiaoping and Obama Kill for Peace?" Facebook blog, 2 pages, December 31, 2016.
<https://www.facebook.com/juyang.weng/posts/10154935187359783>
450. J. Weng, "Life is Science (6): Russians Hacked the U.S. Presidential Election?" Facebook blog, 3 pages, December 26, 2016.
<https://www.facebook.com/juyang.weng/posts/10154916312289783>
451. J. Weng, "Life is Science (5): Why China's Yuan Drops," Facebook blog, 2 pages, December 3, 2016.
<https://www.facebook.com/juyang.weng/posts/10154830559269783>
452. J. Weng, "Life is Science (4): Fidel Castro's Death," Facebook blog, 4 pages, November 27, 2016.
<https://www.facebook.com/juyang.weng/posts/10154812551774783>
453. J. Weng, "Life is Science (3): Why Has Trump Won?" Facebook blog, 4 pages, November 21, 2016.
<https://www.facebook.com/juyang.weng/posts/10154794824589783>
454. J. Weng, "Life is Science (2): Slaves of Blind Brains," Facebook blog, 3 pages, November 6, 2016.
<https://www.facebook.com/juyang.weng/posts/10154741001594783>
455. J. Weng, "Life is Science (1): U.S. President Election and Chinese Government," Facebook blog, 2 pages, November 1, 2016.
<https://www.facebook.com/juyang.weng/posts/10154724214624783>
456. J. Weng, "BMTalk 1: How Brains Work (2 of 2)," YouTube video, 55:59, April 10, 2016.
<https://youtu.be/G9pRTqmGIpM>
457. J. Weng, "BMTalk 1: How Brains Work (1 of 2)," YouTube video, 57:18, April 11, 2016.
https://youtu.be/bjstYJDq_k4
458. J. Weng, "Open Letter to Apple CEO Tim Cook about the U.S. Government Demand," Facebook blog, 2 pages, Feb. 19, 2016.
<https://www.facebook.com/juyang.weng/posts/10153996857359783>

Patents

1. Juyang Weng, “A Developmental Network Model of Conscious Learning in Biological Brains,” U.S. Patent Application Number: 17/702,686, filed March 23, 2022. Approval pending.
2. Juyang Weng and Xiang Wu, “A Robot that Concurrently Learns Recognition and Synthesis while Developing a Motor,” U.S. Provisional Patent Application filed May 5, 2021; U.S. Patent Application Number: 17/379,344, filed July 19, 2021. Approval pending.
3. Juyang Weng, “Learning Machines that Are Free from Post-Selections,” U.S. Provisional Patent Application Serial Number: 63/184/672, filed May 5, 2021, U.S. Non-provisional Patent Application Number: 17/37817. Approval pending.
4. Juyang Weng, “Annotation-Free Conscious Learning Robots Using Sensorimotor Training and Autonomous Imitation,” U.S. Provisional Patent Application Serial Number: 63/179,977, filed April 26, 2021. U.S. Patent Application Number: 17/511,525, filed Oct. 26, 2021. Approval pending.
5. Juyang Weng, Zejia Zheng, and Xiang Wu, Shengjie Zhu, and Juan L. Castro-Garcia “Auto-Programming for General Purposes and Auto-Programming Operating Systems,” GENISAMA LLC sponsored, U.S. Provisional Patent Application Serial Number: 62/628,696, filed Feb. 9, 2018. Approval pending.
6. Juyang Weng, Zejia Zheng, and Xiang Wu, “Developmental Network Two, Its Optimality, and Emergent Turing Machines” GENISAMA LLC sponsored, U.S. Provisional Patent Application Serial Number: 62/624,898, filed Feb. 1, 2018. U.S. Patent Application Number: 16/265,212, filed Feb. 1, 2019. Approval pending.
7. Juyang Weng, “Instantaneous 180-Degree 3D Imaging and Playback Methods,” GENISAMA LLC sponsored, U.S. Patent Application Number: 15/368,667, filed Dec. 4, 2016. International patent application number PCT/IB17/57044 filed Nov. 10, 2017. U.S. Patent No. 10,582,184 B2, approved March 3, 2020.
8. Juyang Weng, Zejia Zheng, and Xie He, “Navigational Control of Robotic Systems and Other Computer Implemented Processes Using Developmental Network with Turing Machine Learning,” MSU sponsored, U.S. Patent Provisional Application Serial Number: 62/191,092, filed July 10, 2015. U.S. Patent application No. 2017/0008168. U.S. Patent No. 10343279 B2, approved July 9, 2019.
9. Juyang Weng, Yukai Wang, and Xiaofeng Wu, “Synapse Maintenance in the Developmental Networks,” MSU sponsored, U.S. Patent Provisional Application Serial Number: 13/949,995, filed July 25, 2012. U.S. Patent No. 8694449, approved August 23, 2016.
10. Juyang Weng, Zhengping Ji, Matthew D. Luciw, and Mojtaba Solgi, “Neuromorphic Spatiotemporal Where-What Machines,” MSU sponsored, U.S. Patent Application Serial Number: 61/182,670, filed May 29, 2009. U.S. Patent No. 8694449, approved April 8, 2014.
11. Juyang Weng, “Multi-layer Learning Network Having In-Place Learning,” MSU sponsored, Application Serial Number. 60/786,257 filed March 27, 2006. US Patent No. 7711663, approved May 4, 2010.
12. Juyang Weng, “Developmental Learning Machine and Method.” MSU sponsored, US Patent No. 6353814, approved March 5, 2002. Also Canadian Patent No. 2,246,637.
13. Juyang Weng and David J. Hammond, “Camera-Aided Virtual Reality Builder (CAVRB).” MSU sponsored, US Patent No. 6081273,, approved June 27, 2000.

Invited Talks and Other Presentations

1. J. Weng, “Brain-Inspired Emergent Universal Turing Machines for Intention, Computer Vision, Audition and Natural Language Understanding,” India Institute of Technology Delhi, Delhi, India, March, 4, 2020.
2. J. Weng, “Brain-Inspired Emergent Universal Turing Machines for Intention, Computer Vision, Audition and Natural Language Understanding,” National Institute of Technology, Himachal Pradesh, India, March, 2, 2020.
3. J. Weng, “Deep Learning vs. Auto-Programming for General Purposes by Robots,” Fudan University, Shanghai, China, Dec. 28, 2019.
4. J. Weng, “Brain-Inspired Emergent Universal Turing Machines for Intention, Computer Vision, Audition and Natural Languages,” Vietnam National University, Hanoi, Vietnam, March 8, 2019.
5. J. Weng, “Brain-Inspired Emergent Universal Turing Machines for Intention, Computer Vision, Audition and Natural Languages,” Hanoi University of Science and Technology, Hanoi, Vietnam, March 8, 2019.
6. J. Weng, “Brain-Inspired Emergent Universal Turing Machines for Intention, Computer Vision, Audition and Natural Languages,” Ho Chi Minh City University of Science, Ho Chi Minh City, Vietnam, March 6, 2019.
7. J. Weng, “Brain-Inspired Emergent Universal Turing Machines for Intention, Computer Vision, Audition and Natural Languages,” Royal University of Phnom Penh, Phnom Penh, Cambodia, March 5, 2019.
8. J. Weng, “Brain-Inspired Emergent Universal Turing Machines for Intention, Computer Vision, Audition and Natural Languages,” Institute of Technology of Cambodia, Phnom Penh, Cambodia, March 4, 2019.
9. J. Weng, Turing Machine Logic in Brain-Inspired Networks for Vision, Speech, and Natural Languages, the 8th International Conference on Extreme Learning Machines (ELM2017) Yan Tai, China, Oct. 4, 2017.
10. J. Weng, “Turing Machine Model for Full Brain, Universal Auto-Programming Machines, and the Future AI Industry,” Institute of Automation, Chinese Academy of Sciences, China, June 27, 2017.
11. J. Weng, “Turing Machine Model for Full Brain, Universal Auto-Programming Machines, and the Future AI Industry,” Institute of Computing Technology, Chinese Academy of Sciences, China, June 27, 2017.
12. J. Weng, “Turing Machine Model for Full Brain, Universal Auto-Programming Machines, and the Future AI Industry,” Beijing University of Technology, Beijing, China, June 26, 2017.
13. J. Weng, “Deep Learning and Machine Fully Autonomous Learning, ” Xinjiang Normal University, Xinjiang, China, June 23, 2017.
14. J. Weng, “Deep Learning and Machine Fully Autonomous Learning, ” Shihezi University, Xinjiang, China, June 20, 2017.
15. J. Weng, “Deep Learning and Machine Fully Autonomous Learning, ” Xinjiang University of Finance and Economics, Xinjiang, China, June 19, 2017.
16. J. Weng, “Deep Learning and Machine Fully Autonomous Learning, ” Xinjiang University, Xinjiang, China, June 19, 2017.
17. J. Weng, “From Deep Learning to Machine Fully Autonomous Learning,” Huang Symposium, University of Illinois, Urbana, IL, Oct. 1, 2016.

18. J. Weng, "Deep Learning and Machine Fully Autonomous Learning," School of Information Science and Technology, Fudan University, Shanghai, China. May 10, 2016.
19. J. Weng, "Deep Learning and Machine Fully Autonomous Learning," School of Computer Science and Technology, Fudan University, Shanghai, China. May 4, 2016.
20. J. Weng, "Deep Learning and Machine Fully Autonomous Learning," Computer Vision Laboratory, College of Computer Science and Software Engineering, Shenzhen University, Shenzhen, China. April 20, 2016.
21. J. Weng, "Deep Learning, Limitations, and Beyond," the Electrical Engineering Department and of the Applied Computational Intelligence Laboratory (ICA), Pontifical Catholic University of Rio de Janeiro, Brazil, Dec. 18, 2015.
22. J. Weng, "A Model to Bridge the Symbolic AI and the Connectionist AI", Center for Vision, Cognition, Learning, and Autonomy, University of California at Los Angeles, CA, Dec. 11, 2015.
23. J. Weng, "Brains as Emergent Attentive Turing Machines," Brain Forum, Tianjing, China, June 27, 2015.
24. J. Weng, "Introduction to Brains as Emergent Turing Machines, " National Jiaotong University, Taiwan, May 12, 2015.
25. J. Weng, "Introduction to Brains as Emergent Turing Machines," National Taiwan University, Taiwan, May 6, 2015.
26. J. Weng, "Neuroscience and AI: Mutual Facilitations, Breakthroughs, and Social Habits," Eastern Forum No. 253, Shanghai, China, March 15, 2015.
27. J. Weng, "Spatil and Temporal Processing in Biological Brains: Architecture, Representations, Adaptation, and Motivation," Institute of Neuroscience, Chinese Academy of Sciences, Shanghai, China, August 12, 2014.
28. J. Weng, "How Does a Brain Model Reveal Brain's Way of 'Big Data'?", Institute of Automation, Beijing, China, July 25, 2014.
29. J. Weng, "The Brain Works like Bridge-Islands with Modulation," International Conference on Brain-Mind, Beijing, China, July 12, 2014.
30. J. Weng, "Big Data: Traps, Challenges, and Opportunities,' Workshop on Big Data," International Joint Conference on Neural Networks, Beijing, China, July 7, 2014.
31. J. Weng, "The Finite Automata (FA) Class is General Purpose and How an FA Emerges from Learning," Institute of Automation, Shengyang, China, May 12, 2014.
32. J. Weng, "The Finite Automata Class is General Purpose and How an FA Emerges from Learning," Institute of Artificial Intelligence and Robotics, Xi'An Jiaotong University, Xi'An, China, May 6, 2014.
33. J. Weng, "The Finite Automata Class is General Purpose and How a General-Purpose FA Emerges from Learning," College of Automation, Northwestern Polytechnical University, Xi'An, China, May 5, 2014.
34. J. Weng, "How Brain-Mind Works with Vision but beyond: Introduction to a Whole-Brain Theory," Brain-Mind Workshop, Fudan University, Shanghai, China, Dec. 21-22, 2013.

35. J. Weng, "A Developmental Theory and Computational Model for Human Whole-Brains," *Workshop on Brain-Cognition Based Strategy for the Development of Information Science*, Department of Basic Research, Chinese Ministry of Science and Technology, Beijing. Dec. 1, 2013.
36. J. Weng, "Obama's BRAIN Initiative, Opportunities, and Resistance from Status Quo, Special Session on Mind, Brain, and Cognitive Algorithms (two panel embers, the other is Terry Sejnowski), Dallas, TX, August 7, 2013.
37. J. Weng, "Obama's BRAIN Initiative and Multidisciplinary Education," Panel on Teaching Cognitive Science and Computational Intelligence, Dallas, TX, August 6, 2013.
38. J. Weng, "Cognitive Robotics: A Brain-Mind Theory and Experiments," NSF Workshop on Cognitive Science, International Joint Conference on Neural Networks, August 6, 2013.
39. J. Weng, "Emotion in Brain-Inspired Developmental Networks," Panel on Higher Emotion, International Joint Conference on Neural Networks, Dallas, TX, August 5, 2013.
40. J. Weng, "Obama's BRAIN Initiative and Resistance from the Status Quo," International Conference on Brain-Mind, East Lansing, Michigan, USA, July 27-28, 2013.
41. J. Weng, "A Theory on the Completeness of the DN Logic Capability," International Conference on Brain-Mind, July 14, East Lansing, Michigan, USA, 2012.
42. J. Weng, "Can Natural Intelligence and Artificial Intelligence Be Unified?," Brain-Mind Workshop, Fudan University, Shanghai, China, Dec. 15-16, 2012.
43. J. Weng, "Why Understanding Brain-Mind Requires 6-Discipline Knowledge," International Conference on Brain-Mind, July 14, East Lansing, Michigan, USA, 2012.
44. J. Weng, "Understanding the (5+1)-Chunk Brain-Mind Model Requires 6-Discipline Knowledge," Brain-Mind Workshop, Dec. 19 - Dec. 20, 2011, Fudan University, Shanghai, China, presented Dec. 19-20, 2011.
45. J. Weng, "Science Should Expand Its Horizon: Suggestions to the US and Chinese Governments," NSF Workshop on US-China Collaborations, Arlington VA, May 23-24, 2011, presented Dec. 24, 2011.
46. J. Weng, "A 5-Chunk Brain-Mind Network Model for Multiple Events in Complex Backgrounds," Keynote Speaker, *Decades of the Mind VI*, Singapore, Oct. 18-20, 2010.
47. J. Weng, "General-Purpose Developmental Robots," Fudan University, June 24, 2010.
48. J. Weng, "Spatiotemporal Processing in the Brain: Attention, Recognition and Abstraction," Dong Hua University, Shanghai, China, Dec. 22, 2009.
49. J. Weng, "Robotic Developmental Vision," Forum of Autonomous Robots, Dalian, China, Sept. 3, 2009.
50. J. Weng, "Spatiotemporal Processing in the Brain: Attention, Recognition and Abstraction," Nanjing University of Science and Technology, China, May 22, 2009.
51. J. Weng, "Autonomous Mental Development: Modeling Brain's Spatial and Temporal Processing," INNS New directions in Neural Networks Symposia (NNN 2008), Auckland, New Zealand, Nov. 24-25, 2008.
52. J. Weng, "Research Environment," College of Computer Science and Engineering Establishment Ceremony Speech, Fudan University, May 27, 2008.

53. J. Weng, "Modeling Abstraction in Cerebral Cortex," Shengyang Institute of Automation, Shengyang, July 14, 2008.
54. J. Weng, "Epigenetic Development: Generating Internal Representations through Interactions with the Real-World Environments," Microsoft Research, Aug. 20, 2007.
55. J. Weng, "Brain-Inspired Autonomous Mental Development," Qingdao University, Jinan, China, July 19, 2007.
56. J. Weng, "Brain-Inspired Autonomous Mental Development," Shandong University, Jinan, China, July 17, 2007.
57. J. Weng, "Biologically Inspired Multilayer In-Place Learning Networks for Autonomous Skill Development," Shengyang Institute of Automation, Shengyang, July 6, 2007.
58. J. Weng, "Biologically Inspired Autonomous Skill Development through Human Machine Interactions," Panel Session, HCI for Multimedia Communications, International Conference on Multimedia and Expo., Beijing, China, July 5, 2007.
59. J. Weng, "Biologically Inspired Multilayer In-Place Learning Networks for Autonomous Skill Development," Changsha University of Science and Technology, Changsha, China, July 3, 2007.
60. J. Weng, "Developmental Robot Brains: Time for Commercialization?" General Motors New Robotics Symposium, May 18, 2007.
61. J. Weng, "Developmental Object Learning Using Video and Radar for a Driver Assistance System," General Motors, Research and Development, April 16, 2007.
62. J. Weng, "Mental architectures for Human Computer Interactions", International Conference on Multimedia and Expo., Beijing, July 2-5, 2007.
63. J. Weng, "Driver Safety and New Robotics Technology," Automotive Institute, Tongji University, Shanghai, March 19, 2007.
64. J. Weng, "Computational Cognitive and Neural Development," Fudan International Symposium on Brain, Cognition, and Computation, Fudan University, Shanghai, March 17 - 18, 2007.
65. J. Weng, "Brain-Inspired Autonomous Mental Development and Computational Mental Models," Department of Electrical and Computer Engineering, Boston University, Department Colloquium, Nov. 6, 2006.
66. J. Weng, "Modeling Cortical Neurons as Lobe Components: Emergence of Receptive Fields, Orientations and More from Natural Images," Annual Meeting of the Charles Rivers Association for Memory, Massachusetts Institute of Technology, 10-minute data blitz, Nov. 1, 2006.
67. J. Weng and M. Luciw, "Multilayer In-Place Learning Network for Functional Development of Sensorimotor Pathways," Annual Meeting of the Charles Rivers Association for Memory, poster presentation, Massachusetts Institute of Technology, poster presentation, Nov. 1, 2006.
68. J. Weng, "Computational Functional Development of the Central Nervous System," Perceptual Science Group, Department of Brain and Cognitive Science, Massachusetts Institute of Technology, Cambridge, Massachusetts, Oct. 30, 2006.

69. J. Weng, "Robotic Mental Architectures and Developmental Algorithms," Shenyang Institute of Automation, Shenyang, Jan. 16, 2006.
70. J. Weng, "Biologically Inspired Architectures and Algorithms for Mental Development," Fudan University, Shanghai, Jan. 7, 2006.
71. J. Weng, "Autonomous Mental Development and Robot Perception," Changsha University of Science and Technology, Changsha, China, Dec. 21, 2005.
72. J. Weng, "Robot Mental Development and Online Learning," Huazhong University of Science and Technology, Wuhan, Dec. 20, 2005.
73. J. Weng, "Online Learning for Multimodal Sensing, Attention and Data Fusion," GM Research and Development, Sept. 2, 2005.
74. J. Weng, "Autonomous Mental Development by Robots and Animals," Dept. of Computer Science, Wayne State University, Sept. 28, 2004.
75. J. Weng, "Mentally Developing Robots," Fudan University, Shanghai, China, Jan. 6, 2004.
76. J. Weng, "What Makes Us Human?," Michigan *One Book, One Community Program*, invited talk and panel discussion, East Lansing Public Library, Oct. 2, 2003.
77. J. Weng, "Robot Mental Development and Online Learning," Forschungszentrum Informatik, University of Karlsruhe, Karlsruhe, Germany, July 8, 2003.
78. J. Weng, "Robot Mental Development and Online Learning," University of Hamburg, Hamburg, Germany, July 4, 2003.
79. J. Weng, "Developmental Robotics: A New Paradigm," Second International Workshop on Epigenetic Robotics: Modeling Cognitive Development in Robotic Systems, Edinburgh, Scotland, August 10 - 11, 2002.
80. J. Weng, "Autonomous Mentally Developing Robots," National Chiao Tung University, Taiwan, Nov. 29, 2002.
81. J. Weng, "Autonomous Mental Development by Robots and Animals," Academia Sinica, Taiwan, Nov. 28, 2002.
82. J. Weng, "Autonomous Mental Development and Online Learning," National Tsing Hua University, Taiwan, Nov. 27, 2002.
83. J. Weng, "Progress in Intelligent Robot Research," Institute of Image Processing and Pattern Recognition, School of Electronics and Information Technology, Shanghai Jiao Tong University, Shanghai, China, June 31, 2002.
84. J. Weng, "Concept Completeness of Intelligent Machines," Department of Computer Science, Fudan University, Shanghai, China, June 31, 2002.
85. J. Weng, "New Advances in Developmental Robot Research," Shenyang Institute of Automation, Chinese Academy of Sciences, Shenyang, China, June 30, 2002.
86. J. Weng, "A Fundamental Flaw of Agent Models: Completeness of Intelligent Machines," Microsoft Research Asia, Beijing, China, May 17, 2002.

87. J. Weng, "Autonomous Mental Development for Robots," Institute of Automation, Chinese Academy of Sciences, Beijing, China, May 16, 2002.
88. J. Weng, "Action Chaining in Autonomous Mental Development," Institute of Computing Technology, Chinese Academy of Sciences, Beijing, China, May 15, 2002.
89. J. Weng, "SAIL Robot for Autonomous Mental Development with Uncertainty," IJCAI-2001: Workshop on Reasoning with Uncertainty in Robotics," Seattle, Washington, August 4-5, 2001.
90. J. Weng, "Autonomous Programming by Robots: Mental Development," Microsoft Research, Redmond, Washington, July 20, 2001.
91. J. Weng, "Hierarchical Discriminant Regression (HDR) for Pattern Detection, Recognition and Autonomous Machine Learning," Institute of Image Processing and Pattern Recognition, School of Electronics and Information Technology, Shanghai Jiao Tong University, Shanghai, China, July 5, 2001.
92. J. Weng, "Hierarchical Discriminant Regression for Robot Mental Development," Shenyang Institute of Automation, Chinese Academy of Sciences, Shenyang, China, June 28, 2001.
93. J. Weng, "Hierarchical Discriminant Regression for Pattern Detection, Recognition and Autonomous Machine Learning," Institute of Computing Technology, Chinese Academy of Sciences, Beijing, China, June 27, 2001.
94. J. Weng, "Hierarchical Discriminant Regression for Multimodal Development and Integration," Institute of Automation, Chinese Academy of Sciences, Beijing, China, June 26, 2001.
95. J. Weng, "Multimodal Development and Online Learning," Microsoft Research, Beijing, China, June 25, 2001.
96. J. Weng, "Online Machine Learning for Cognitive Development," Department of Computer Science, Fudan University, Shanghai, China, June 19, 2001.
97. J. Weng, "Autonomous Mental Development by Robots and Animals," College of Engineering, University of Michigan at Dearborn, Dearborn, MI Feb. 16, 2001.
98. J. Weng, "DRS: An Integrated Hybrid Software Framework for Autonomous Mobile Robots," DARPA MARS-DRS 2000 Spring Conference, Huston, TX, May 24, 2000.
99. J. Weng, "Some Major Research Problems for Autonomous Mental Development by Machines," NSF/DARPA Workshop on Development and Learning, Michigan State University, East Lansing, MI, April 5-7, 2000.
100. J. Weng, "Quests for Mental Development Models," NSF/DARPA Workshop on Development and Learning, Michigan State University, East Lansing, MI, April 5-7, 2000.
101. J. Weng, "Discriminant Regression Tree for Image-Based Search and Automatic Skill Development," Dagstuhl Seminar: Multi-Image Search, Filtering, Reasoning and Visualization. Schloss Dagstuhl. International Conference and Research Center for Computer Science, Wadern, Germany, March 12 - 17, 2000.
102. J. Weng, "DRS: An Integrated Hybrid Software Framework for Autonomous Mobile Robots," DARPA MARS Workshop, Aberdeen, MD, January, 12, 2000.
103. J. Weng, "Living Machines: The Developmental Approach to Artificial Intelligence," Beckman Institute, University of Illinois, Urbana, IL, Nov. 11, 1999.

104. J. Weng, "Living Machines: The Developmental Approach to Artificial Intelligence," Human Dynamics Group, Media Laboratory, Massachusetts Institute of Technology, Cambridge, Massachusetts, Sept. 30, 1999.
105. J. Weng, "Developmental Machines" Nissan Cambridge Basic Research, Cambridge, Massachusetts, Sept. 27, 1999.
106. J. Weng, "The Developmental Approach to Intelligent Machines," Siemens Corporate Research, Princeton, New Jersey, September, 9, 1999.
107. J. Weng, "DRS: An Integrated Hybrid Software Framework for Autonomous Mobile Robots," DARPA MARS Kick-off meeting, Orlando, FL, July 22, 1999.
108. J. Weng, "Living Machines: The Developmental Approach to Artificial Intelligence," Advanced Telecommunications Research Institute International (ATR), Kyoto, Japan, July 6, 1999.
109. J. Weng, "Living Machines: The Developmental Approach to Artificial Intelligence," Welback Enterprises Limited, Hong Kong, June 14, 1999.
110. J. Weng, "Living Machines: The Developmental Approach to Artificial Intelligence," National Laboratory of Pattern Recognition, Chinese Academy of Sciences, Beijing, China, June 11, 1999.
111. J. Weng, "The Developmental Robots," Shenyang Institute of Automation, Chinese Academy of Sciences, Shenyang, China, June 10, 1999.
112. J. Weng, "Living Machines: The Developmental Approach to Artificial Intelligence," Department of Computer Science, Fudan University, Shanghai, China, May 31, 1999.
113. J. Weng, "Developmental Learning Machines," *Robotics Department, Mechanical Engineering Laboratory, MITI*, Japan, April 14, 1998.
114. J. Weng, "The Role of Learning," *1998 AAAI Spring Symposium Series, Integrating Robotic Research: Taking The Next Leap*, Stanford University, March 23-25, 1998.
115. J. Weng, "Developmental Learning Machines," Jet Propulsion Laboratory, Pasadena, California, Oct. 8, 1997.
116. J. Weng, "Machine Learning for Vision and Beyond," Siemens Corporate Research, Princeton, New Jersey, May 22, 1997.
117. J. Weng, "Visual Learning and Visualization," Naval Surface Warfare Center, West Bethesda, Maryland, May 9, 1997.
118. J. Weng, "Sensing, Control, Intelligence, and Learning," *IEEE Workshop on Architectures or Mathematics: What Determines the Design of Intelligent Systems*, Dearborn, MI, September 19, 1996.
119. J. Weng, "Toward Multimedia Understanding Systems," Artificial Intelligence Laboratory, Department of Electrical and Computer Science, *University of Michigan*, Ann Arbor, Michigan, March 23, 1996.
120. J. Weng, "SHOSLIF: A framework for sensor-based learning for high-dimensional complex systems," *IEEE Workshop on Architectures for Semiotic Modeling and situation analysis in Large Complex Systems*, Monterey, CA, Aug. 29, 1995.
121. J. Weng, "Frameworks for Visual Learning," *Delft University of Technology*, Delft, The Netherlands, June 29, 1995.

122. J. Weng, "Frameworks for Visual Learning," *Stanford University*, Seminar on Computational Learning and Adaptation, June 14, 1995.
123. J. Weng, "Frameworks for Visual Learning," *IBM Almaden Research Center*, San Jose, CA, June 13, 1995.
124. J. Weng, "Frameworks for Visual Learning," *Ricoh California Research Center*, Menlo Park, CA, June 12, 1995.
125. J. Weng, "Frameworks for Visual Learning," *Center for Biological and Computational Learning*, Massachusetts Institute of Technology, Cambridge, Massachusetts, Oct. 19, 1994.
126. J. Weng, "SHOSLIF: A Learning System for Vision and Control," *IEEE Annual Workshop on Architectures for Intelligent Control Systems*, Columbus, Ohio, August 16, 1994.
127. J. Weng, "SHOSLIF: A framework for Object Recognition from Images," *IEEE International Conference on Neural Networks*, Orlando, FL, July 1, 1994.
128. J. Weng, "On Comprehensive Visual Learning," *NSF/ARPA Workshop on Performance vs. Methodology in Computer Vision*, Seattle, WA, June 25, 1994.
129. J. Weng, "Research on Computer Vision," Department of Computer Science, Fudan University, Shanghai, China, Seminar series, April 12 - 13, 1994.
130. J. Weng, "A Self-Organizing Approach to Object Recognition," *International Symposium of Young Investigators on Information, Computers and Control*, Beijing, China, Feb. 2, 1994.
131. J. Weng, "Learning and Recognition using Cresceptron," Siemens Corporate Research, Princeton, New Jersey, July 1993.
132. J. Weng, "Image Understanding and Neural Networks," *Computer Science Department, Michigan State University*, East Lansing, Michigan, April 1992.
133. J. Weng, "Image Understanding and Neural Networks," *Computer Science Department, Purdue University*, West Lafayette, IN, March 1992.
134. J. Weng, "Image Analysis: Motion Estimation, Neural Learning, and Recognition," Siemens Corporate Research, Princeton, NJ, March 1992.
135. J. Weng, "Image Understanding and Neural Networks," *Computer Science Department, Oklahoma State University*, Stillwater, Oklahoma, USA, Feb. 1992.
136. J. Weng, "New Techniques for Intelligent Robots," *University of Montreal*, Montreal, Quebec, Canada, Nov. 1991.
137. J. Weng, "Computer Vision and Neural Computing," *NEC Research Institute*, Princeton, NJ, USA, Nov. 1991.
138. J. Weng, "Dynamic Scene Analysis," *Department of Computer Science, University of North Carolina at Charlotte*, Charlotte, NC, USA, April, 1991.
139. J. Weng, "Stereo and Temporal Image Matching: Theory and Algorithm," *Nippon Telegraph and Telephone Corporation*, Tokyo, Japan, Nov. 1990.
140. J. Weng, "Motion Analysis and Structure from Motion," *Signal and Image Processing Institute, University of Southern California*, Los Angeles, CA, USA, June. 1989.

141. J. Weng, "Image Analysis and Scene Reconstruction," *National Defense Research Establishment Valcartier*, Courcellette, Quebec, Canada, March, 1989.
142. J. Weng, "Computer Vision and Autonomous Navigation," *National Defense Research Establishment Ottawa*, Ottawa, Canada, March, 1989.
143. J. Weng, "Motion Analysis and Structure from Motion," *Computer Research Institute of Montreal (CRIM)*, Montreal, Quebec, Canada, Nov., 1988.
144. J. Weng, "Motion and Structure from Image Sequences," *McGill Research Center for Intelligence Machine*, McGill University, Montreal, Quebec, Canada, April, 1988.
145. J. Weng, "Estimating Motion and Structure from Image Sequences," *IBM Los Angeles Scientific Center*, Los Angeles, CA, USA, June. 1987.

Conference Tutorials and BMI (Brain-Mind Institute) Courses

1. J. Weng, "Emergent Universal Turing Machines in Developmental Networks: Vision, Audition, Natural Languages, APFGP and Thinking," IEEE 40th International Conference on Consumer Electronics, Las Vegas, 3 hours, 11:00am-11:30am Q&A, Jan. 9, 2022. <https://youtu.be/nVxqJfRceMU> under a more popular science title, "Conscious Robots".
2. J. Weng, "Emergent Universal Turing Machines in Developmental Networks: Vision, Audition, Natural Languages, APFGP and Imitation", 2021 IEEE International Conference on Multisensor Fusion and Integration for Intelligent Systems (MFI 2021), Karlsruhe, Germany, 7:30pm-8:30pm, Sept. 25, 2021. <https://youtu.be/a4G3Tp27G5Q> under a more popular science title, "Emergent Universal Turing Machines in DN for Auto-Programming for General Purposes".
3. J. Weng, "Emergent Universal Turing Machines in Developmental Networks: Vision, Audition, Natural Languages, APFGP and Concious AI," International Conference on Development and Learning and Epigegetic Robotics, (ICDL-EpiRob 2020), 11:00am - 2pm, Oct. 29, 2020.
4. J. Weng, "Mechanisms of Universal Turing Machines: Vision, Audition, Natural Language, APFGP and Consciousness," International Joint Conference on Neural Networks, 7pm - 9pm, July 19, 2020.
5. J. Weng, "BMI 871: Computational Brain-Mind," East Lansing, Michigan, Aug. 12 -31, 2018.
6. J. Weng, "BMI 861: Brain Automata," East Lansing, Michigan, July 23 - Aug. 10, 2018.
7. J. Weng, "BMI 831: Cognitive Science for Brain-Mind Research," East Lansing, Michigan, July 2 - 20, 2018.
8. J. Weng, "BMI 871: Computational Brain-Mind," East Lansing, Michigan, July 10 - July 28, 2017.
9. J. Weng, "BMI 861: Brain Automata," East Lansing, Michigan, June 19 - July 7, 2017.
10. J. Weng, "BMI 831: Cognitive Science for Brain-Mind Research," East Lansing, Michigan, May 29 - June 16, 2017.
11. J. Weng, "Brain-Inspired Turing Machine Logic in Neural Networks for Vision, Speech, and Natural Languages," International Joint Conference on Neural Networks, 3:50pm - 5:50pm, May 14, Anchorage, AL 2017.
12. J. Weng, "BMI 871: Computational Brain-Mind," East Lansing, Michigan, July 11 - July 29, 2016.
13. J. Weng, "BMI 861: Brain Automata," East Lansing, Michigan, June 20 - July 8, 2016.
14. J. Weng, "BMI 831: Cognitive Science for Brain-Mind Research," East Lansing, Michigan, May 30 - June 17, 2016.
15. J. Weng, "Introduction to Brains as Emergent Turing Machines," International Conference on Development and Learning, and on Epigenetic Robotics (ICDL-EpiRob), Brown University, Providence, RI, USA,. 9:00am - noon, August 13, 2015.
16. J. Weng, "Introduction to How Brains Deal with Big Data," INNS Conference on Big Data 2015, San Francisco, California, USA, 8:00am - 10:00am, August 8, 2015.
17. J. Weng, BMI 871: Computational Brain-Mind, East Lansing, Michigan, July 20 - Aug. 7, 2015.

18. J. Weng, BMI 861: Brain Automata, East Lansing, Michigan, June 22 - July 10, 2015.
19. J. Weng, BMI 831: Cognitive Science for Brain-Mind Research, East Lansing, Michigan, June 1 - June 19, 2015.
20. J. Weng, "BMI 871: Computational Brain-Mind," East Lansing, Michigan, June 14 - August 1, 2014.
21. J. Weng, "Introduction to Computational Brain-Mind," 3 hours, International Conference on Development and Learning, and on Epigenetic Robotics (ICDL-EpiRob), Osaka, Japan, August 18-22, 2013,
22. J. Weng, "Natural and Artificial Intelligence: Introduction to Computational Brain-Mind," International Joint Conference on Neural Networks, Dallas, TX, 8:00am - 9:45am, August 4, 2013.
23. J. Weng, "BMI 831: Cognitive Science for Brain-Mind Research," East Lansing, Michigan, July 15 - Aug. 2, 2013.
24. J. Weng, "BMI 871: Computational Brain-Mind," Fudan University, Shanghai, China, June 17 - July 5, 2013.
25. J. Weng, "BMI 871: Computational Brain-Mind," Fudan University, Shanghai, China, August 6 - 24, 2012.
26. J. Weng, "Computational Brain-Mind: From Biology, Neuroscience, Psychology, Computer Science, Electrical Engineering, and Mathematics," 13:00-17:00, WCCI wide tutorial, World Congress on Computational Intelligence, Brisbane, Australia, June 10, 2012.
27. J. Weng, "Computational Brain-Mind: Development, Architecture, Areas, Space, Time, and Modulation," 4 hours, IEEE 10th International Conference on Development and Learning, and on Epigenetic Robotics (ICDL-EpiRob), Frankfurt, Germany, August 24-27, 2011.
28. J. Weng, "Brain-Mind Explained in Mathematics," Fudan University, 6 hours, May 16 and 30, 2011.
29. J. Weng, "A Computational Introduction to the Brain-Mind," 1.5 hours, 2011 INNS International Educational Symposium on Neural Networks, Lima, Peru, January, 25-27, 2011.
30. J. Weng, "General-Purpose Vision Architecture, Invariance, Attention and Reasoning," 3 hours, IEEE Conference on Computer Vision and Pattern Recognition, San Francisco, June 13-18, 2010.
31. J. Weng, "Brain Inspired Mental Architectures," 3 hours. IEEE 8th International Conference on Development and Learning, June 4, 2009.
32. J. Weng, "Cognitive and Neural Development," 2.5 hours, IEEE/INNS International Joint Conference on Neural Networks, Orlando, Florida, August 12, 2007.
33. J. Weng, "Computational Cognitive and Neural Development," Dragon Star Lecture Series, 30 hours, Fudan University, Shanghai, China, July 23 - 27, 2007.
34. J. Weng, "Biologically Motivated Mental Architectures," 2.5 hours, IEEE World Congress on Computational Intelligence, Vancouver, Canada, July 16, 2006.
35. J. Weng, "Autonomous Mental Development," 1.5 hours, 3rd International Conference on Development and Learning, Salk Institute, La Jolla, CA, Oct. 20, 2004.
36. J. Weng, "Autonomous Mental Development: A New Frontier for Computational Intelligence," 2 hours, International Joint Conference on Neural Networks, Budapest, July 25, 2004.

37. J. Weng, "Autonomous Mental Development," 18 lecture hours, Institute of Information, Fudan University, Shanghai, China, June 28 - July 3, 2004.
38. J. Weng, "Developmental Vision," 3 hours, 6th Asian Conference on Computer Vision, Jeju, Korea, Jan. 27-30, 2004.
39. J. Weng, "Autonomous Mental Development and On-line Learning from Multimedia Signal Streams," 3 hours, IEEE International Symposium on Intelligent Signal Processing and Communication Systems, Kaohsiung, Taiwan, Nov. 21-24, 2002.
40. J. Weng, "Autonomous Mental Development for Robots," 3 hours, IEEE International Conference on Development and Learning, Cambridge, MA, June 12-15, 2002.
41. J. Weng, "Robot Mental Development and Online Learning," 3 hours, IEEE International Conference on Robotics and Automation, Seoul, Korea, May 21-26, 2001.
42. J. Weng, "Mental Development and On-line Learning," 3 hours, IASTED International Conference on Robotics and Applications (RA 2000), Honolulu, Hawaii, August 14-16, 2000.

Courses Taught:

Three Institutions: (1) MSU: CPS, CSE; (2) Brain-Mind Institute: BMI; (3) MIT: BCS, EECS

Semester	Course No.	Level	Course Title
Fall 1992	CPS803	Graduate	Computer Vision
Spring 1993	CPS472	Undergraduate	Computer Graphics
Fall 1993	CPS902	Graduate	Selected Topics in PR: Analysis of Image Sequences
Spring 1994	CPS472	Undergraduate	Computer Graphics
Fall 1994	CPS360	Undergraduate	Automata and Formal Language Theory
	CPS803	Graduate	Computer Vision
Spring 1995	CPS360	Undergraduate	Automata and Formal Language Theory
Fall 1995	CPS360	Undergraduate	Automata and Formal Language Theory
Spring 1996	CPS902	Graduate	Selected Topics in PR: Learning for Computer Vision and Beyond
	CPS472	Undergraduate	Computer Graphics
Fall 1996	CPS803	Graduate	Computer Vision
Spring 1997	CPS330	Undergraduate	Data Structure and Programming
	CPS472	Undergraduate	Computer Graphics
Fall 1997	CPS330	Undergraduate	Data Structure and Programming
	CPS803	Graduate	Computer Vision
Spring 1998	CPS902	Graduate	Selected Topics in PR: Multimodal Learning and Information Fusion
Fall 1998	CPS803	Graduate	Computer Vision
Spring 1999	CPS360 Sec 1	Undergraduate	Automata and Formal Language Theory
	CPS360 Sec 2	Undergraduate	Automata and Formal Language Theory
Fall 1999	-	-	Sabbatical at MIT
Spring 2000	-	-	Sabbatical at MIT
Fall 2000	CSE803	Graduate	Computer Vision
Spring 2001	CSE902	Graduate	Selected Topics in PR: Mental Development and Online Learning
Fall 2001	CSE841	Graduate	Artificial Intelligence
	CSE440	Undergraduate	Artificial Intelligence and Symbolic Programming
Spring 2002	-	-	-
Fall 2002	CSE803	Graduate	Computer Vision
	CSE841	Graduate	Artificial Intelligence
Spring 2003	-	-	-
Fall 2003	CSE841	Graduate	Artificial Intelligence
	CSE941	Graduate	Selected Topics in AI: Autonomous Mental Development
Spring 2004	CSE460	Undergraduate	Computability and Languages
Fall 2004	CSE803	Graduate	Computer Vision
	CSE841	Graduate	Artificial Intelligence
Spring 2005	-	-	-
Fall 2005	CSE460	Undergraduate	Computability and Languages
	CSE841	Graduate	Artificial Intelligence
Spring 2006	-	-	-
Fall 2006	-	-	Sabbatical at MIT
Spring 2007	MIT BCS9.915 also EECS6.887	Graduate	Computational Cognitive and Neural Development http://stellar.mit.edu/S/course/9/sp07/9.915J/ (Sabbatical)

Semester	Course No.	Level	Course Title
Fall 2007	CSE803	Graduate	Computer Vision
	CSE331	Undergraduate	Algorithms and Data Structures
Spring 2008	CSE331	Undergraduate	Algorithms and Data Structures
Fall 2008	CSE841	Graduate	Artificial Intelligence
	CSE891	Graduate	Brain Inspired Developmental Systems (1 credit)
Spring 2009	CSE331	Undergraduate	Algorithms and Data Structures (2 sections)
	CSE891	Graduate	Brain Inspired Developmental Systems (1 credit)
Fall 2009	CSE331	Undergraduate	Algorithms and Data Structures
	CSE941	Graduate	Selected Topic in AI: Developmental Vision
Spring 2010	CSE331	Undergraduate	Algorithms and Data Structures
Fall 2010	CSE841	Graduate	Artificial Intelligence
	CSE331	Undergraduate	Algorithms and Data Structures
Spring 2011	CSE331	Undergraduate	Algorithms and Data Structures
Fall 2011	CSE941	Graduate	Selected Topic in AI: Computational Brain-Mind
Spring 2012	CSE331	Undergraduate	Algorithms and Data Structures (2 sections)
Summer 2012	BMI 871	Graduate & above	Computational Brain-Mind (3 credits) (Weng 2012 as textbook)
	BMI 811	Graduate & above	Biology for Brain-Mind Research (3 credits) Weng as a registered student, passed
	BMI 821	Graduate & above	Neuroscience for Brain-Mind Research (3 credits) Weng as a registered student, passed
Fall 2012	CSE841	Graduate	Artificial Intelligence (Weng 2012 and Russell & Norvig 2010 as textbooks)
Spring 2013	CSE260	Undergraduate	Discrete Structures in Computer Science (2 sections)
Summer 2013	BMI 871	Graduate & above	Computational Brain-Mind (3 credits) (Weng 2012 as textbook)
	BMI 831	Graduate & above	Cognitive Science for Brain-Mind Research (3 credits) (Gluck, Mercado & Myers 2013 as textbook)
Fall 2013	CSE841	Graduate	Artificial Intelligence (Weng 2012 and Russell & Norvig as textbooks)
	CSE440	Undergraduate	Introduction to Artificial Intelligence (Weng 2012 and Russell & Norvig as textbooks)
Spring 2014	CSE260	Undergraduate	Discrete Structures in Computer Science (2 sections)
Summer 2014	BMI 871	Graduate & above	Computational Brain-Mind (3 credits) (Weng 2012 as textbook)
Fall 2014	CSE841	Graduate	Artificial Intelligence (Weng 2012 as textbooks)
	CSE260	Undergraduate	Discrete Structures in Computer Science (3 sections)
Spring 2015	CSE260	Undergraduate	Discrete Structures in Computer Science (2 sections)
Summer 2015	BMI 831	Undergraduate & graduate	Cognitive Science for Brain-Mind Research (3 credits) (Mark A. Gluck et al. 2013 as textbook)
	BMI 861	Undergraduate & graduate	Brain Automata (3 credits) (John Martin 2011 as textbook for symbolic automata)
	BMI 871	Graduate	Computational Brain-Mind (3 credits) (Weng 2012 as textbook)

Semester	Course No.	Level	Course Title
Fall 2015	CSE260	Undergraduate	Discrete Structures in Computer Science (3 sections)
Spring 2016	CSE260	Undergraduate	Discrete Structures in Computer Science (3 sections)
Summer 2016	BMI 831	Undergraduate & graduate	Cognitive Science for Brain-Mind Research (3 credits) (Mark A. Gluck et al. 2013 as textbook)
	BMI 861	Undergraduate & graduate	Brain Automata (3 credits) (John Martin 2011 as textbook for symbolic automata)
	BMI 871	Graduate	Computational Brain-Mind (3 credits) (Weng 2012 as textbook)
Fall 2016	CSE841	Graduate	Artificial Intelligence (Weng 2012 as textbook)
Spring 2017	CSE260	Undergraduate	Discrete Structures in Computer Science (6 sections)
Summer 2017	BMI 831	Undergraduate & graduate	Cognitive Science for Brain-Mind Research (3 credits) (Mark A. Gluck et al. 2013 as textbook)
	BMI 861	Undergraduate & graduate	Brain Automata (3 credits) (John Martin as textbook for symbolic automata)
	BMI 871	Graduate	Computational Brain-Mind (3 credits) (Weng 2012 as textbook)
Fall 2017	CSE460	Undergraduate	Intro. Computability and Formal Language Theory
Spring 2018	CSE220	Undergraduate	Programming in C (3 sections)
Summer 2018	BMI 831	Undergraduate & graduate	Cognitive Science for Brain-Mind Research (3 credits) (Mark A. Gluck et al. 2013 as textbook)
	BMI 861	Undergraduate & graduate	Brain Automata (3 credits) (John Martin as textbook for symbolic automata)
	BMI 871	Graduate	Computational Brain-Mind (3 credits) (Weng 2012 as textbook)
Fall 2018	CSE220	Undergraduate	Programming in C (3 sections)
	CSE460	Undergraduate	Intro. Computability and Formal Language Theory
Spring 2019	CSE220	Undergraduate	Programming in C (3 sections)
Summer 2019	BMI 831	Undergraduate & graduate	Cognitive Science for Brain-Mind Research (3 credits) (Mark A. Gluck et al. 2013 as textbook)
	BMI 861	Undergraduate & graduate	Brain Automata (3 credits) (John Martin as textbook for symbolic automata)
	BMI 871	Graduate	Computational Brain-Mind (3 credits) (Weng, 2nd edition, 2019 as textbook)
Fall 2019	CSE220	Undergraduate	Programming in C (2 sections)
	CSE460	Undergraduate	Intro. Computability and Formal Language Theory
Spring 2020	CSE220	Undergraduate	Programming in C (3 sections)
Fall 2020	CSE460	Undergraduate	Intro. Computability and Formal Language Theory

Research Grants at MSU

- Toyota Research Institute of North America, “Research for Autonomous Development of Vision”, March 4, 2013, \$20,000.
- Microsoft Research, Redmond, “Research on Autonomous Development,” research gift, March 4, 2013, \$20,000.
- Toyota Research Institute of North America, “Brain-Mind Institute Summer School,” scholarship grant, April - December 2012, \$4000.
- IEEE Computational Intelligence Society, Education Committee, “Brain-Mind Institute Summer School,” scholarship grant, April - December 2012, \$3500.
- Microsoft Research, Redmond, “Learning-based approaches in computer vision,” research gifts, Nov., 2011, \$15,000.
- Toyota North America, “Study of performance of Where-What Network with multiple internal areas,” Research contract, March 1, 2010 - Dec. 31, 2011. \$10,123.
- Toyota Technical Center USA, “Attention and recognition,” Research gifts, Aug. 2008, \$32,000.
- Toyota Technical Center USA, “Attention Based Vehicle and Pedestrian Detection,” Research gifts, Nov. 2007, \$25,000.
- GM Research and Development, “Object Classification in Sensor Fusion Using Attention,” Research contract, Nov. 15, 2007 - May 30, 2008, \$40,881.
- GM Research and Development, “Object Classification in Sensor Fusion,” Research contract, July 1, 2006 ? June 30, 2007, \$77,630.
- GM Research and Development, “Online Learning for Multimodal Sensing, Attention, and Data Fusion,” research gift, Jan. 1, 2006. \$18,000.
- AVS, “Mobile Robot Navigation,” research gifts, Oct. 2004, \$35,000.
- Microsoft Research, Redmond, “Learning-based approaches in computer vision,” research gifts, Nov., 2004, \$20,000.
- Microsoft Research, Redmond, “Learning-based approaches in computer vision,” research gifts, Aug., 2003, \$30,000.
- Zyvex, Developmental Robots, research gifts, December 2003, \$5,000.
- SAIC, “Robotics Research,” research gifts, December 2003, \$35,000
- Microsoft Research, Redmond, “Learning-based approaches in computer vision,” research gifts, August, 2002, \$30,000.
- DARPA, Mobile Autonomous Robot Software (MARS) program. “DRS: An Integrated Hybrid Software Framework for Autonomous Mobile Robots,” June 29, 1999 - June 28, 2003, (PI, with N. Xi and S. Mahadevan), \$2,526,344 (including MSU matching \$255,833).
- DARPA, Distributed Robotics program. “Reconfigurable Adaptable Micro-Robots,” June 19, 1998 - June 18, 2001, (with D. Aslam, S. Mahadevan, R. Mukherjee, R. L. Tummala and N. Xi), \$1,704,355 (including MSU matching \$241,697).

MSU Strategic Partnership Grant, “Intelligent Robot Initiative,” July, 1999 - June 31, 2002, (PI, with N. Xi and S. Mahadevan), \$600,000.

NSF (jointly with DARPA) IIS 9900498, “Workshop on Development and Learning,” Sept. 15, 1999 - Nov. 30, 2000, (PI, with Ida Stockman), \$30,000.

NSF IIS 9815191, “Exploratory Study for Interactive Development of An Object Recognizer,” August, 16, 1998 - Sept. 30, 2000. \$49,996.

Microsoft Research, Redmond, “Learning-based approaches in computer vision,” research gifts, August, 2001, \$30,000.

Zyvex, “Developmental robots,” research gifts, Dec. 2001, \$5,000; Dec. 2000, \$5,000; Dec. 1999, \$7,500; May 1998, \$7,546; August 1997, \$5,000. Total: \$30,046.

Siemens Corporate Research, “Learning in Computer Vision,” research gifts, August 1998, \$32,000; August 1997, \$20,000. Total: \$52,000.

NSF, “Equipment for Real-Time Interaction with Images,” January 1, 1997– December 31, 1998, (with George Stockman and Anil Jain), \$65,934.

ONR (Office of Naval Research), “Efficient View Inference Learning for Object Recognition: A Supplement”, May 27, 1996 – March 26, 1998, \$24,880.

NSF, REU program, “Learning-Based Object Recognition from Images”, June 1, 1995 – May 31, 1996, \$5,000; June 1, 1996 – May 31, 1997, \$5,000.

NSF, “Cooperative Multimedia Computing Laboratory”, June 1, 1995– May 31, 1998, (with Phil Mckinley and Betty Cheng), \$94,610.

ONR (Office of Naval Research), “Efficient View Inference Learning for Object Recognition”, March 27, 1995 – Sept. 30, 1998, \$281,496.

Total: \$5,915,795.

Juyang Weng
May 19, 2022