

Zhengping Ji

3119 Trappers Cove Apt. 2D
Lansing, 488910, MI, USA
<http://www.cse.msu.edu/~jizhengp>

Phone: 517-775-1459
Fax: 517-432-9474
Email: jizhengp@msu.edu

RESEARCH INTERESTS

Brain modeling, biological vision, machine learning, mobile robotics.

EDUCATION

Ph.D., Computer Science & Engineering, **09/2004 - 09/2008**
Michigan State University, (GPA 3.8/4.0) **(expected)**

Graduate Specialization in Cognitive Science, **09/2004 - 09/2008**
Michigan State University, **(expected)**

B.S., Electronic Information Systems, **09/1999 - 07/2003**
Sichuan University, China, (GPA 3.9/4.0)

HONORS AND AWARDS

Academic Travel Grant, Graduate School, Michigan state University, 2008

International Travel Grant, International Studies and Programs, Michigan State University, 2008

IEEE IJCNN Student Travel Grants Awards, IEEE CIS, 2008

Toyota Graduate Research Support, Toyota Technical Center, 2008

Dissertation Completion Fellowship, College of Engineering, Michigan State University, 2007

Graduate Office Fellowship, Graduate School, Michigan State University, 2007

Excellent Graduation Paper Award, Sichuan University, 2003

Outstanding Undergraduate Award, Sichuan University, 2003

Undergraduate Scholarship, Sichuan University, 1999-2003

Top Undergraduate Student Award, Sichuan University, 1999-2002

RESEARCH EXPERIENCES

Embodied Intelligence Laboratory, Department of Computer Science & Engineering, Michigan State University, USA

Research Assistant (Adviser: Dr. Juyang Weng) **08/2004 - Present**

- **Where-What Network:** Designed a developmental network, called Where-What Network (WWN), for a general sensorimotor pathway, in which both attention-based recognition (what) and object-based spacial attention (where) were integrated by a single network.
- **Object Classification in Sensor Fusion:** Developed an object classification module in a sensor fusion framework. The Multilayer In-place Learning Network (MILN) was used as a brain-inspired general-purpose network to resolve a series of challenges for object learning, such as general invariance, in-place learning and completeness of representation.
- **Autonomous Outdoor Navigation:** Outfitted an autonomous driving vehicle, called Crosser, for DARPA Grand Challenge, 2005. Developed an attention-based reinforcement learning approach to outdoor navigation, which were used by Team AVS and Team Crossland.
- **Autonomous Mental Developmental Learning:** Worked on humanoid robots (SAIL and DAV) for our research of developmental learning, emphasizing acquisition of perceptual, cognitive and motor skills through real-time online interactions with the physical real world. Two systems were designed, i.e., indoor navigation using reinforcement learning and object categorization by topographic class grouping.

IBM Research Laboratory, College of Eli Broad Business, Michigan State University, USA

Research Assistant **05/2005 - 10/2005**

- Implemented grid computing technology using network architectures of IBM research lab in business school. Composed tutorials for the future research related to grid computing of educational use.

Image Information Institute, Sichuan University, China

Research Assistant **08/2002 - 06/2004**

- **Fingerprint Identification System:** Designed a fingerprint identification stand-alone system, composed of micro fingerprint grabber, image acquisition card, microprocessor, DSP, FPGA and identification module.
- **Chromosome Image Analysis:** Developed an automatic image segmentation of overlapping G-banded chromosomes, with the application to genetic syndrome diagnosis.

WORK EXPERIENCES

Toyota Technical Center, Ann Arbor, USA

Research Internship (Mentor: Dr. Danil Prokhorov) **08/2007-12/2007**

- Integrated a vision-based learning system to an autonomous driving vehicle. Designed a perceptual learning system with the prediction to dynamic environments.

Research Internship (Mentor: Dr. Machael James)

05/2007- 08/2007

- Developed a vision-based learning system using MobilEye/ Ladybug camera systems, which incorporates information from a long-range radar, laser scanners and DGPS system. Both lane detection and target recognition were accomplished for the real-time sequential decision task.

PUBLICATIONS

Journal/Conference Papers (Chronological)

- **Z. Ji**, J. Weng and D. Prokhorov, “Where-What Network I: Where and What Features Assist Each Other Through Top-down Connections”, IEEE International Conference on Development and Learning (ICDL’08), Monterey, California, 2008.
- **Z. Ji**, X. Huang and J. Weng, “Perceptual Learning of Sensorimotor Behaviors by a SASE Agent for Vision-based Navigation”, IEEE International Joint Conference on Neural Networks (IJCNN’08), Hongkong, 2008.
- **Z. Ji**, M. Luciw and J. Weng, “Epigenetic Sensorimotor Pathways and Its Application to Developmental Object Learning”, IEEE Congress on Evolutionary Computation (CEC’08), Hongkong, 2008.
- D. Prokhorov, **Z. Ji**, “Radar-camera Fusion for Object Classification”, International Conference on Information Fusion (FUSION’08), Cologne, Germany, 2008.
- **Z. Ji**, M. Luciw, J. Weng and S. Zeng, “A Biologically-Motivated Developmental System for Perceptual Awareness in Vehicle-Based Robots”, International Conference on Epigenetic Robotics (EpiRob’07), Rutgers, 2007.
- H. Zhao, **Z. Ji** and J. Weng, “Developmental Learning for Avoiding Dynamic Obstacles Using Attention”, IEEE International Conference on Development and Learning (ICDL’07), London, 2007.
- M. Luciw and **Z. Ji**, “Building Blocks of Development”, IEEE Computational Intelligence Magazine, vol. 1, no. 3, pp. 5-9, 2006.
- **Z. Ji**, X. Huang, W. Tong and J. Weng, “On-line Learning of Covert and Overt Perceptual Capability for Vision-based Navigation”, IEEE International Conference on Development and Learning (ICDL’06), Bloomington, Indiana, May 31-June 3, 2006.
- J. Wang and **Z. Ji**, “A Dynamic Image Processing System for Plasma Display Panels”, Journal of Image Display, vol.5, pp. 37-40, 2004.
- **Z. Ji** and L. Qin, “Design and Realization of Image Acquisition for Automobile Anti-collision Systems”, Systems of Engineering and Electronics, vol.3, 124-132, 2004.

Book Chapter:

- S. Zhang, K. Liao and **Z. Ji**, Protel DXP– Circuit and PCB Design, Tsinghua University Press, 2004, ISBN 7-302-07716-9.

Papers in Preparation:

- “On-line Learning of Covert and Overt Sensorimotor Behaviors by a Developmental Robot”, to be submitted to IEEE Transaction on Neural Networks.
- “Where-What Network (WWN): Integration of Attention and Recognition by a General Sensorimotor Pathway”, to be submitted to IEEE Transaction on Neural Networks.

PRESENTATIONS **Z. Ji**, J. Weng and D. Prokhorov, “Where-What Network I: Where and What Features Assist Each Other Through Top-down Connections”, IEEE International Conference on Development and Learning, Monterey, California, Aug. 11, 2008.

Z. Ji, “Epigenetic Sensorimotor Pathways and Its Application to Developmental Object Learning”, IEEE Congress on Evolutionary Computation, Hongkong, June 6, 2008.

Z. Ji, “Perceptual Learning of Sensorimotor Behaviors by a SASE Agent for Vision-based Navigation”, IEEE International Joint Conference on Neural Networks, Hongkong, June 2, 2008.

Z. Ji, “A Biologically-Motivated Developmental System for Perceptual Awareness in Vehicle-Based Robots”, International Conference on Epigenetic Robotics, Rutgers, October 2, 2007.

Z. Ji, “Vision-based Sensor Fusion for Driver Assistance Systems”, Toyota Technical Center, Ann Arbor, July 20, 2007.

J. Weng, **Z. Ji** and M. Luciw, “Developmental Object Learning Using Video and Radar for a Driver Assistance System”, General Motors, Research and Development, Warren, April 16, 2007.

Z. Ji, “On-line Learning for Covert and Overt Perceptual Capabilities”, IEEE International Conference on Development and Learning, Bloomington, June 2, 2006

PROFESSIONAL ACTIVITIES **Member:** Student Member of IEEE, Student Member of IEEE Computational Intelligence Society (IEEE-CIS), Student Member of International Neural Network Society (INNS).

Reviewer: IEEE International Conference on Development and Learning 2008 (ICDL 2008), IEEE World Congress on Computational Intelligence 2008 (WCCI 2008), International Conference on Development and Learning 2007 (ICDL 2007), International Journal of Humanoid Robotics.

TECHNICAL QUALIFICATION Programming Languages: MATLAB, C, C++, Shell Scripts

Tools: Latex

Operating Systems: Linux, Windows.

TEACHING EXPERIENCE **Michigan State University**, East Lansing, Michigan, USA

Teaching Assistant **08/2004 - 12/2004**
Consulted for course projects and weekly computer lab exercises in the course of MATLAB.

Teaching Assistant **01/2005 - 05/2005**
Consulted for course projects and weekly computer lab exercises in the course of C++.

COURSES Computer Vision, Analysis of Stochastic Systems, Pattern Recognition, Artificial Intelligence, Cognitive Development, Machine Learning, Data Mining, Theory of Algorithms, Network Security.

REFERENCES Available upon request