

# SOWEON YOON

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## EDUCATION

- Michigan State University** East Lansing, MI August 2008 – May 2014
- Ph.D., Computer Science and Engineering
  - Advisor: Anil K. Jain
  - Dissertation: *Fingerprint Recognition: Models and Applications*
- Yonsei University** Seoul, South Korea March 2006 – February 2008
- M.S., Electrical and Electronic Engineering
  - Advisor: Jaihie Kim
  - Thesis: *Non-intrusive Iris Image Capturing System for Biometric Authentication*
- Yonsei University** Seoul, South Korea March 2002 – February 2006
- B.S., Electrical and Electronic Engineering

## EXPERIENCE

- Scientific Research Specialist** Dakota Consulting Inc. September 2015 – Present  
**Contractor** National Institute of Standards and Technology  
Forensics, computer vision, bio-image analysis
- Visiting Adjunct Research Associate** Michigan State University July 2015 – Present
- Post-doctoral Researcher** Michigan State University July 2014 – July 2015  
**Guest Researcher** National Institute of Standards and Technology  
Fingerprint recognition: Sufficiency of information contained in latent fingerprints for fingerprint individualization
- Graduate Research Assistant** Michigan State University August 2008 – May 2014  
Fingerprint and palmprint matching: Orientation field modeling, latent fingerprint matching, detection and matching of altered fingerprints, longitudinal study of fingerprint recognition
- Summer Internship** Cogent Systems, Pasadena, CA May 2009 – August 2009  
Latent fingerprint matching
- Graduate Research Assistant** Yonsei University March 2006 – August 2008  
Prototype of a non-intrusive iris image acquisition system based on a pan-tilt-zoom camera and light stripe projection
- Teaching Assistant** Yonsei University March 2007 – June 2007  
Digital Logic Circuit
- Undergraduate Research Assistant** Yonsei University January 2005 – August 2005  
Real-time face detection and tracking using far-infrared image sequences

## HONORS AND AWARDS

- Fitch H. Beach Award (Third Place), College of Engineering, Michigan State University, 2014
- Outstanding Graduate Student Award, Department of Computer Science and Engineering, Michigan State University, 2014
- IAPR Best Biometrics Student Paper Award (with Q. Zhao and A. K. Jain), IAPR International Conference on Biometrics (ICB), New Delhi, India, March 2012
- IAPR Best Biometrics Student Paper Award (with J. Feng and A. K. Jain), IAPR International Joint Conference on Biometrics (IJCB), Washington, D.C., October 2011
- IAPR/IEEE Best Biometrics Poster Award (with K. Bae, K. R. Park, and J. Kim), IAPR/IEEE International Conference on Biometrics (ICB), Seoul, Korea, August 2007
- Full scholarship from Yonsei Graduate School
- Honors Student, 1st Semester, 2005, Yonsei University
- Highest Honors Student, 2nd Semester, 2002, Yonsei University

## PUBLICATIONS

### Magazine Articles

- Anil K. Jain and Soweon Yoon, “Automatic Detection of Altered Fingerprints”, *IEEE Computer*, vol. 45, no. 1, pp. 79–82, January 2012.

### Journal Articles

- Soweon Yoon and Anil K. Jain, “Longitudinal Study of Fingerprint Recognition”, *Proceedings of the National Academy of Sciences of the United States of America*, vol. 112, no. 28, pp. 8555–8560, July 2015.
- Soweon Yoon, Jianjiang Feng, and Anil K. Jain, “Altered Fingerprints: Analysis and Detection”, *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 34, no. 3, pp. 451–464, March 2012.
- Soweon Yoon, Ho Gi Jung, Kang Ryoung Park, and Jaihie Kim, “Non-intrusive Iris Image Acquisition System Based on a Pan-Tilt-Zoom Camera and Light Stripe Projection”, *Optical Engineering*, vol. 48, no. 3, pp. 037202–15, March 2009.

### Conference Proceedings

- Soweon Yoon, Kai Cao, Eryun Liu, and Anil K. Jain, “LFIQ: Latent Fingerprint Image Quality”, *IEEE International Conference on Biometrics: Theory, Applications and Systems*, pp. 1–8, Washington, D.C., September 29–October 2, 2013.
- Soweon Yoon and Anil K. Jain, “Is There a Fingerprint Pattern in the Image?”, *IAPR International Conference on Biometrics*, pp. 1–8, Madrid, Spain, June 4–7, 2013.
- Soweon Yoon, Eryun Liu, and Anil K. Jain, “On Latent Fingerprint Image Quality”, *International Workshop on Computational Forensics in conjunction with IEEE International Conference on Pattern Recognition*, pp. 1–16, Tsukuba, Japan, November 11, 2012.
- Soweon Yoon, Qijun Zhao, and Anil K. Jain, “On Matching Altered Fingerprints”, *IAPR International Conference on Biometrics*, pp. 222–229, New Delhi, India, March 29–April 1, 2012. (**IAPR Best Biometrics Student Paper Award**)
- Soweon Yoon, Jianjiang Feng, and Anil K. Jain, “Latent Fingerprint Enhancement via Robust Orientation Field Estimation”, *IAPR International Joint Conference on Biometrics*, Washington, D.C., October 11–13, 2011. (**IAPR Best Biometrics Student Paper Award**)
- Soweon Yoon, Jianjiang Feng, and Anil K. Jain, “On Latent Fingerprint Enhancement”, *SPIE Defense, Security, and Sensing: Biometrics Technology for Human Identification Conference*, pp. 766707–10, Orlando, FL, April 5–6, 2010.

- Jianjiang Feng, Soweon Yoon, and Anil K. Jain, “Latent Fingerprint Matching: Fusion of Rolled and Plain Fingerprints”, *IAPR/IEEE International Conference on Biometrics*, pp. 695–704, Alghero, Italy, June 2–5, 2009.
- Sowon Yoon, Kwanghyuk Bae, Kang Ryoung Park, and Jaihie Kim, “Pan-Tilt-Zoom Based Iris Image Capturing System for Unconstrained User Environments at a Distance”, *IAPR/IEEE International Conference on Biometrics*, pp. 653–662, Seoul, Korea, August 27–29, 2007. **(IAPR/IEEE Best Biometrics Poster Award)**
- Sowon Yoon, Ho Gi Jung, Jae Kyu Suhr, and Jaihie Kim, “Non-intrusive Iris Image Capturing System Using Light Stripe Projection and Pan-Tilt-Zoom Camera”, *IEEE Computer Society Workshop on Biometrics in conjunction with IEEE Conference on Computer Vision and Pattern Recognition*, pp. 1–7, Minneapolis, MN, June 18, 2007.
- Soweon Yoon and Jaihie Kim, “Analysis of Iris Image Degradation Factors” (in Korean), *The Institute of Electronics Engineers of Korea Summer Conference*, June 18–20, 2008.
- Sowon Yoon, Ho Gi Jung, and Jaihie Kim, “Light Stripe Detection in Fisheye Images for 3D Reconstruction Based on Light Stripe Projection” (in Korean), *The Institute of Electronics Engineers of Korea Fall Conference*, vol. 30, no. 2, pp. 771–772, November 24, 2007.
- Hyun Hee Park, So Won Yoon, and Jaihie Kim, “Real-time Face Detection and Tracking Using Far-infrared Imagery” (in Korean), *The Institute of Electronics Engineers of Korea Summer Conference*, vol. 28, no. 1, pp. 205–208, June, 2005.

#### Technical Report

- Soweon Yoon and Anil K. Jain, “Longitudinal Study of Fingerprint Recognition”, *MSU Technical Report*, MSU-CSE-14-3, June 9, 2014.

#### PRESENTATIONS

- “Longitudinal Study of Fingerprint Recognition”, *Global Identity Summit (GIS)*, Tampa, FL, September 16–18, 2014.
- “On the Persistence of Fingerprints”, *International Biometric Performance Conference (IBPC)*, Gaithersburg, MD, April 1–3, 2014.
- “Fingerprint Recognition: Models and Applications”, Yonsei University, Seoul, Korea, February 7, 2014.
- “Latent Fingerprint Image Quality”, *Fingerprint Image Quality Assessment NFIQ 2.0*, Winchester, U.K., April 26, 2013.
- “Latent Fingerprint Enhancement” and “Altered Fingerprints: Analysis, Detection, and Matching”, MorphoTrak, Anaheim, CA, December 3–13, 2012.
- “Latent Fingerprint Enhancement via Robust Orientation Field Estimation”, *Impression and Pattern Evidence Symposium*, Clearwater Beach, FL, August 6–9, 2012.
- “Whodunnit? Latent Fingerprints: Making a Powerful Crime Fighting Tool Even Better”, *National Institute of Justice (NIJ) Conference*, Arlington, VA, June 18–20, 2012.
- “Fingerprint Recognition”, Dayalbagh University, Agra, India, April 3, 2012.
- “Altered Fingerprints: Redefining Fingerprint Quality Measures”, *International Biometric Performance Conference, Satellite Workshop: Technical Update on the Second Generation NFIQ Algorithm*, Gaithersburg, MD, March 5–9, 2012.
- “Altered Fingerprints: Analysis and Detection”, *Korea Biometrics Conference*, Seoul, Korea, November 28, 2011.
- “Altered Fingerprints” and “Latent Fingerprint Enhancement”, Morpho, Issy Les Moulineaux, France, March 7–11, 2011.

- “Fingerprint Alteration”, *The 95th International Educational Conference of the International Association for Identification (IAI)*, Spokane, WA, July 11–17, 2010.

## PROFESSIONAL ACTIVITIES

### Program Committee

- Biometrics: Theory, Applications and Systems, 2012, 2015
- International Joint Conference on Biometrics, 2014
- International Conference on Biometrics, 2013

### Reviewer

- IEEE Transactions on Information Forensics and Security
- IEEE Transactions on Image Processing
- Pattern Recognition Letters
- IEEE International Conference on Biometrics, 2013, 2015
- IEEE Biometrics: Theory, Applications and Systems, 2012, 2015
- IEEE International Joint Conference on Biometrics, 2014
- IEEE International Conference on Image Processing, 2015
- IEEE International Conference on Acoustics, Speech and Signal Processing, 2015, 2016
- European Signal Processing Conference, 2015

## TECHNOLOGY TRANSFER

- Michigan State University has licensed the technology to detect altered fingerprints (developed by Soweon Yoon, Jianjiang Feng, and Anil K. Jain) to Morpho, May 5, 2011.  
[www.egr.msu.edu/news/2011/09/16/technology-detecting-altered-fingerprints-developed-msu-licensed-biometrics-company](http://www.egr.msu.edu/news/2011/09/16/technology-detecting-altered-fingerprints-developed-msu-licensed-biometrics-company)
- Algorithm of detecting altered fingerprints (version 2) was licensed to Morpho on December 27, 2013.

## PATENTS

- Jaihie Kim, Kang Ryoung Park, Soweon Yoon, and Ho Gi Jung, “Non-Intrusive Iris Image Acquisition System and Method Thereof”, Korea Patent No. 1009042540000, September 16, 2009.
- Jaihie Kim, Kang Ryoung Park, Hyun Su Jo, Kwanghyuk Bae, and Soweon Yoon, “Iris Image Acquisition System at a Long Distance”, Korea Patent No. 1008699980000, November 17, 2008.