

Byung-Woo Hong

CONTACT INFORMATION

Assistant Professor
School of Computer Science and Engineering
Chung-Ang University
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RESEARCH INTERESTS

Computer Vision, Medical Image Analysis, Image Processing, Digital Mammography, Face Recognition, Feature Extraction, Shape Analysis, Segmentation, Registration, Reconstruction, Texture Analysis, Level Set Methods, Variational Methods.

EDUCATION

University of Oxford, Oxford, U.K.

Department of Engineering Science

D.Phil., Information Engineering, Oct. 2001-Dec. 2004

- Dissertation Topic: "Segmentation, Shape and Registration: Application to Mammography"
- Advisor: Sir Prof. Michael Brady

Weizmann Institute of Science, Rehovot, Israel.

Department of Computer Science

M.Sc., Computer Science, Sep. 1999-Sep. 2001

- Thesis Topic: "Feature selection for sub-ordinate classification"
- Advisor: Prof. Shimon Ullman

Chung-Ang University, Seoul, Korea.

Department of Mathematics

B.Sc., Mathematics, Mar. 1992-Aug. 1995

RESEARCH EXPERIENCE

University of California Los Angeles, L.A., U.S.A.

Department of Computer Science

Visiting Professor, Jan. 2009-Feb. 2009

- Research Topic: "Multi-scale Integral Invariants"
- Host: Prof. Stefano Soatto

University of California Los Angeles, L.A., U.S.A.

Department of Computer Science

Visiting Professor, Jun. 2008-Aug. 2008

- Research Topic: "Texture Segmentation"
- Host: Prof. Stefano Soatto

University of California Los Angeles, L.A., U.S.A.

Department of Computer Science

Post-Doctoral Researcher, Apr. 2005-Feb. 2008

- Research Topic: "PDE-based Computer Vision for Segmentation, Registration, and Shape"
- Advisor: Prof. Stefano Soatto

RIKEN Brain Science Institute, Hirosawa, Japan.

Laboratory for Integrative Neural Systems

Visiting Researcher, Jun. 2006-Aug. 2006

- Research Topic: "Representation of Scale-Invariant Fragments in Recognition"
- Advisor: Dr. Manabu Tanifuji

University of California Los Angeles, L.A., U.S.A.

Department of Computer Science

Visiting Research Student, Aug. 2003-Jul. 2004

- Research Topic: "Shape Analysis"
- Advisor: Prof. Stefano Soatto

University of California Irvine, Irvine, U.S.A.

Department of Electrical Engineering

Visiting Research Student, Jun. 2003-Aug. 2003

- Research Topic: "Digital Mammography"
- Advisor: Prof. Jack Sklansky

Weizmann Institute of Science, Rehovot, Israel.

Department of Computer Science

Visiting Research Student, Dec. 2002-Jan. 2003

- Research Topic: "Fragment-based Face Classification"
- Advisor: Prof. Shimon Ullman

HONORS AND AWARDS

- UCLA (Computational Center for Biology): *Post-doctoral Research Fund*. 2005-2008
- The British Government: *ORS Award*. 2001-2004
- The Oxford University Press: *Clarendon Bursary* (Most competitive scholarship in Oxford). 2001-2004
- The Israel Government: *Israel Government Scholarship*. 1999-2001
- The Weizmann Institute of Science: *Full Fellowship*. 1999-2001
- Chung-Ang University: *Summa Cum Laude* (Top in the natural science college). 1995
- Chung-Ang University: *Early Graduation* (First case in the department). 1995
- Chung-Ang University: *Academic Achievement Scholarship* (Throughout all the undergraduate years). 1992-1995

PROFESSIONAL ACTIVITIES

- Reviewer: *IEEE Transactions on Systems, Man, and Cybernetics (TSMC)*.
- Reviewer: *IEEE Transactions on Image Processing (TIP)*.
- Reviewer: *Computer Vision and Image Understanding (CVIU)*.
- Reviewer: *IEEE Transactions on Pattern Analysis and Machine Intelligence (PAMI)*.
- Reviewer: *International Conference on Computer Vision (ICCV 2009)*.
- Programme Committee: *British Machine Vision Conference (BMVC 2007)*.
- Programme Committee: *British Machine Vision Conference (BMVC 2006)*.
- Reviewer: *European Conference on Computer Vision (ECCV 2006)*.
- Reviewer: *International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI 2006)*.
- Reviewer: *International Conference on Medical Image Computing and Computer Assisted Intervention (MICCAI 2005)*.

TECHNICAL SKILLS

- Programming Languages: C++, Matlab, MFC, OpenCV, VTK, ITK.
- Platforms: Windows, Unix/Linux, Visual Studio, gcc, Object-Oriented Programming.
- MS Office Softwares and Graphics Softwares.
- Certificate of InformationProcessing Engineer Class I (Issued by Korean Government).

PROFESSIONAL
EXPERIENCE

Oxford Science Enterprise Centre., Said Business School, Oxford, U.K.

Course Participant

2003

Completed an Entrepreneurship and Business Skills Course titled "The Basics of Building a Business."

Electronic Design Automation Division, Seodu Logic, Inc., Seoul, Korea

Software Engineer

April, 1996-April, 1999

Carried out software development projects.

INVITED
WORKSHOPS

MFO Workshop: Trends in Mathematical Imaging and Surface Processing organised by Martin Rumpf, Gerhard Dziuk, Vicent Caselles and Peter Schroder. Mathematisches Forschungsinstitut Oberwolfach, Schwarzwaldstr, Germany. Jan. 21 - Jan. 27. 2007.

IMA Annual Program Year Workshop: Visual Learning and Recognition organised by Donald Geman, Jitendra Malik and Shimon Ullman. Institute for Mathematics and its Applications, Minneapolis, Minnesota, USA. May 22 - May 26. 2006.

The SIAM Imaging Conference: Mathematical Methods and Tools for Volumetric Brain Segmentation organised by the Center for Computational Biology. Minneapolis, Minnesota, USA. May. 15 - May. 17. 2006.

IMA Annual Program Year Workshop: Shape Spaces organised by David Mumford and Laurent Younes. Institute for Mathematics and its Applications, Minneapolis, Minnesota, USA. Apr. 3 - Apr. 7. 2006.

Summer School on Level Set Methods and ITK organised by the Swedish Society for Automated Image Analysis. Linkoping University, Linkoping, Sweden. Aug. 22 - Aug. 24. 2005.

Statistical Inferences on Shape Manifolds organised by Washington Mio, David Mumford, and Anuj Srivastava. American Institute of Mathematics, Palo Alto, California. May 6 - May 9, 2005.

PUBLICATIONS

Jonghye Woo, Piotr Slomka, Damini Dey, Victor Cheng, Amit Ramesh, **Byung-Woo Hong**, Daniel Berman, C.-C. Jay Kuo, Guido Germano. "Automated multi-modality registration of 64-slice coronary ct angiography with myocardial perfusion spect".

IEEE International Symposium on Biomedical Imaging. Boston, Massachusetts, Jun. 2009.

B.-W. Hong. "Segmentation of Regions of Interest in Mammograms in a Topographic Approach". *IEEE Transactions on Information Technology in BioMedicine*. Under review.

K. Ni, **B.-W. Hong**, S. Soatto, and T. Chan. "Unsupervised Multiphase Segmentation: a Recursive Approach".

Computer Vision and Image Understanding. 2009.

B.-W. Hong, S. Soatto, and L. Vese. "Enforcing Local Context into Shape Statistics". *Advances in Computational Mathematics*. 2009.

Jonghye Woo, **B.-W. Hong**, Damini Dey, Ganesh Sundaramoorthi, Amit Ramesh, Guido Germano, Victor Cheng, Jay Kuo, Piotr Slomka. "Feature-based Non-rigid Volume Registration of Serial Coronary CT Angiography (CCTA)".

SPIE Symposium on Medical Imaging. Lake Buena Vista, Florida, Feb. 2009.

Jonghye Woo, **B.-W. Hong**, Amit Ramesh, Jay Kuo, Piotr Slomka. "Curve evolution with a dual shape similarity and its application to segmentation of left ventricle".

SPIE Symposium on Medical Imaging. Lake Buena Vista, Florida, Feb. 2009.

Jonghye Woo, **B.-W. Hong**, Chang-Hong Hu, Kirk Shung, and Jay Kuo. "Non-rigid Ultrasound Image Registration Based on Intensity and Local Phase Information". *Journal of Signal Processing Systems*. 2009.

B.-W. Hong, K. Ni, and S. Soatto. "Scale of Texture and its Application to Segmentation". *IEEE Conference on Computer Vision and Pattern Recognition*. Anchorage, Alaska, Jun. 2008.

S. Thiruvankadam, T. Chan, and **B.-W. Hong**. "Segmentation under Occlusions using Selective Shape Prior". *SIAM Journal on Imaging Sciences*, vol. 1, no. 1, 2008.

M. Mellor, **B.-W. Hong**, and M. Brady. "Locally rotation, contrast and scale invariant descriptors for texture analysis". *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 30, no. 1, 2008.

J.-H. Woo, **B.-W. Hong**, S. Kumar, I. B. Ray, and C.-C. J. Kuo. "Multi-modal Data Integration for ComputerAided Ablation of Atrial Fibrillation". *Journal of Biomedicine and Biotechnology*. 2008.

J.-H. Woo, **B.-W. Hong**, S. Kumar, I. B. Ray, and C.-C. J. Kuo. "Reconstruction incorporating Shape Prior for Computer-Aided Ablation of Atrial Fibrillation". *International Conference on Frontiers in the Convergence of Bioscience and Information Technologies*. Jeju, Korea, Oct. 2007.

S. Thiruvankadam, T. Chan, and **B.-W. Hong**. "Segmentation under Occlusions using Selective Shape Prior". *Scale Space Variational Methods*. Ischia, Italy, May. 2007.

S. Manay, D. Cremers, **B.-W. Hong**, A. Yezzi, and S. Soatto. "Shape Matching via Integral Invariants". *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 28, no. 10, 2006.

B.-W. Hong, E. Prados, L. Vese, and S. Soatto. "Shape Representation based on Integral Kernels: Application to Image Matching and Segmentation". *IEEE Conference on Computer Vision and Pattern Recognition*. New York, Jun. 2006.

S. Manay, **B.-W. Hong**, D. Cremers, A. Yezzi, and S. Soatto. "Integral Invariants and Shape Matching". *Book Chapter: Statistics and Analysis of Shapes*. Hamid Krim and Anthony Yezzi (Eds.) 2006.

B.-W. Hong, and M. Brady. "Structural Comparison of Mammogram Pairs". *British Machine Vision Conference*. Oxford, Sep. 2005

B.-W. Hong, M. Mellor, S. Soatto, and M. Brady. "Combining Topological and Geometric Features of Mammograms to Detect Masses". *Medical Image Understanding and Analysis*. London, Sep. 2004.

S. Manay, **B.-W. Hong**, A. Yezzi, and S. Soatto. "Integral Invariant Signatures". *European Conference on Computer Vision*. Prague, May. 2004.

B.-W. Hong, and M. Brady. "A Topographic Representation for Mammogram Segmentation". *Medical Image Computing and Computer Assisted Intervention*. Montreal. Nov. 2003.

B.-W. Hong, and M. Brady. "Segmentation of Mammograms in Topographic Approach".

IEE International Conference on Visual Information Engineering. Guildford. Jul. 2003.

- RESEARCH FUNDS
- KRF. \$20,000. Aug. 2008 - Jul. 2009.
 - KISA. \$30,000. Jun. 2008 - Dec. 2008.
 - CAU. \$5,000. 2008 - 2009.
 - CAU. \$7,000. 2008.

REFERENCES

Professor Shimon Ullman

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Professor Sir Michael Brady FRS FREng

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