

Taeg Sang (Tim) Cho

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Education

Massachusetts Institute of Technology

Ph.D. Candidate, Electrical Engineering and Computer Science (Expected: Sep 2010)

Cambridge, MA

Jun 2007 – present

- Advisor: William T. Freeman
- Thesis title: *Motion Blur Removal in Photographs* GPA : 5.0 / 5.0
- Characterized motion blur in 3D Fourier domain, and developed machine learning algorithms and imaging electronics for automatic blur removal
 - to appear at 2010 IEEE ICCP
- Analyzed methods to automatically solve image jigsaw puzzles using belief propagation
 - to appear at 2010 IEEE CVPR
- Devised automatic jigsaw puzzle solver for photo editing tasks: object removal, object rearrangement
 - received paper award at 2008 IEEE CVPR
- Designed and engineered artificial intelligent system for automatic skin cancer detection
 - published at 2007 IEEE MMBIA

S.M. Electrical Engineering and Computer Science

Sep 2005 – Jun 2007

- Advisor: Anantha Chandrakasan
- Thesis title: *An Energy Efficient CMOS Interface to Carbon Nanotube Sensor Arrays* GPA : 5.0 / 5.0
- Designed and implemented integrated chip for world's most power efficient chemical sensor system
 - received paper award at 2007 IEEE CICC and design award at 2008 ACM DAC / IEEE ISSCC
- Investigated sensor specifications for extreme power efficiency
- Initiated collaboration with device research group

Korea Advanced Institute of Science and Technology (KAIST)

Daejeon, South Korea

B.S. Electrical Engineering

Mar 2002 – Aug 2005

- Top rank in the School of Engineering GPA : 4.14 / 4.3
- Conceptualized and developed real-time parking lot detection system for automatic automobile parking
 - received bronze medal at 2004 Hyundai Motors Automobile design contest

Work Experience

Hewlett-Packard Labs – Multimedia Communications and Networking Lab

Palo Alto, CA

Visiting research fellow, Mentor: Tom Malzbender

Jan 2010

- Analyzed user gaze direction control techniques for teleconferencing applications

Microsoft Research – Interactive Visual Media Group

Redmond, WA

Research intern, Mentor: Rick Szeliski

May 2009 – Aug 2009

- Studied and developed a content-aware image prior for image restoration – to appear at 2010 IEEE CVPR
- Developed a gradient distribution matching based image deconvolution technique – to be submitted to 2010 ECCV

Massachusetts Institute of Technology, 6.869 Advances in Computer Vision

Cambridge, MA

Teaching assistance, Average TA rating: 6.4/7.0

Feb 2009 – May 2009

- Co-developed 5 problem sets / solutions, and 2 exams / solutions.
- Held weekly office hours

Adobe Systems Inc. – Creative Technologies Lab

Newton, MA

Research intern, Mentor: Shai Avidan

May 2008 – Aug 2008

- Developed image editing techniques using the idea of solving jigsaw puzzles
- Conceptualized and implemented algorithms to accelerate image editing – to appear at IEEE TPAMI
- Filed two patents

Electronics and Telecommunications Research Institute

Daejeon, South Korea

Intern

Dec 2004 – Feb 2005

- Programmed FPGA using hardware description language for custom designed integrated chip testing

Publications

Computer Vision / Computer Graphics

“A content-aware image prior”

T. S. Cho, N. Joshi, C. L. Zitnick, S. B. Kang, R. Szeliski, W. T. Freeman
to appear at 2010 IEEE Conference on Computer Vision and Pattern Recognition (CVPR)

“A probabilistic image jigsaw puzzle solver”

T. S. Cho, S. Avidan, W. T. Freeman
to appear at 2010 IEEE Conference on Computer Vision and Pattern Recognition (CVPR)

“Motion blur removal with orthogonal parabolic exposures”

T. S. Cho, A. Levin, F. Durand, W. T. Freeman
to appear at 2010 IEEE International Conference on Computational Photography (ICCP)

“The patch transform”

T. S. Cho, S. Avidan, W. T. Freeman
to appear at IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI)

“The patch transform and its applications to image editing”

T. S. Cho, S. Avidan, W. T. Freeman
2008 IEEE Conference on Computer Vision and Pattern Recognition (CVPR)

“Motion invariant photography”

A. Levin, P. Sand, T. S. Cho, F. Durand, W. T. Freeman
2008 ACM Transactions on Graphics, Proceedings of SIGGRAPH

Medical Imaging

“A reliable skin mole localization scheme”

T. S. Cho, W. T. Freeman, H. Tsao
2007 IEEE Workshop on Mathematical Methods in Biomedical Image Analysis (MMBIA)

“A new modeling method for objects with branching problems using non-uniform B-spline”

H. S. Kim, Y. H. Kim, Y. H. Choe, S.-M Kim, T. S. Cho, J. H. Mun
2004 International Conference on Computational Science (ICCS)

Integrated Circuit Design

“A $32\mu\text{W}$ 1.83kS/s carbon nanotube chemical sensor system”

T. S. Cho, K. -J. Lee, J. Kong and A. Chandrakasan
2009 IEEE Journal of Solid-State Circuits (JSSC)

“The design of a low power carbon nanotube chemical sensor system”

T. S. Cho, K. -J. Lee, J. Kong and A. Chandrakasan
2008 ACM Design Automation Conference (DAC)

“A low power carbon nanotube chemical sensor system”

T. S. Cho, K. -J. Lee, J. Kong and A. Chandrakasan
2007 IEEE Custom Integrated Circuits Conference (CICC)

Patents

“Patch jittering for visual artifact correction” - Pending

T. S. Cho, S. Avidan, W. T. Freeman

“Candidate pruning for patch transforms” - Pending

T. S. Cho, S. Avidan, W. T. Freeman

“Method and apparatus for motion invariant imaging” - Pending

A. Levin, P. Sand, T. S. Cho, F. Durand, W. T. Freeman

Awards and Honors

IEEE Conference on Computer Vision and Pattern Recognition Best Poster Paper Award	2008
Design Automation Conference / International Solid-State Circuits Conference Student Design Contest Award	2008
IEEE Custom Integrated Circuits Conference Student Paper Award: Student Scholarship	2007
Samsung Scholarship Foundation – Graduate Research Fellowship	2005 – 2010
Korea Foundation for Advanced Studies – Graduate Research Fellowship (Declined)	2005 – 2009
General Electric Foundation – Undergraduate Scholarship	2004 – 2005
Korea Foundation for Advanced Studies – Undergraduate Scholarship	2003 – 2005
Hyundai Motors Automobile Design Contest – Bronze Medal	2004
KAIST Computing Festival – Silver Medal	2004

Invited presentations

“The patch transform and its applications to image editing”

Microsoft Research, Interactive Visual Media Group, June 20 2008

“A low power carbon nanotube chemical sensor system”

IEEE International Solid-State Circuits Conference (ISSCC), February. 2008

A low power carbon nanotube chemical sensor system”

MARCO Interconnect Focus Center, Oct. 3. 2007

”A low power carbon nanotube chemical sensor system”

National Semiconductor Inc., May. 3. 2007

“Design and Characterization of Hybrid CNT-CMOS Systems”

MARC, Jan, 2007

“A low power dynamic voltage scaling system”

Young Generation Technical and Leadership Conference '07, Jan. 5. 2007

Skills

MATLAB, C/C++, Java, CUDA, Shell script

Professional Activities and Services

Reviewer for papers in circuit design / computer graphics / computer vision	2007 – present
JSSC, SIGGRAPH, TPAMI, CVPR, ICCV, ECCV, ICCP, Eurographics, CICC	
MIT CSAIL Student Workshop – Poster / Demo Session Chair	2007
MIT Graduate Student Council – EECS Representative	2006 – 2008
MIT EECS Graduate Students Association – Executive Committee	2006 – 2008
The KAIST Herald – Journalist	2002 – 2005
Student member of IEEE, ACM	2005 – present

References

Professor William T. Freeman
Computer Science and Artificial Intelligence Lab
Massachusetts Institute of Technology

Professor Frédo Durand
Computer Science and Artificial Intelligence Lab
Massachusetts Institute of Technology

Professor Shai Avidan
Tel-Aviv University