

Jonghyun Choi

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[Google Scholar Page](#) | [Semantic Scholar Page](#) | [DBLP](#)

Research Interest

Computer Vision and Machine Learning: Efficient but accurate visual recognition models, algorithms and systems in terms of labeling cost, computational complexity of training and inference.

Education

University of Maryland, College Park (MD, USA)

Ph.D., Electrical and Computer Engineering

May 2015

– Advisor: Prof. Larry S. Davis (Computer Vision)

◊ UMD ECE distinguished Ph.D. dissertation fellowship 2015

Seoul National University (Seoul, South Korea)

M.S., Electrical Engineering and Computer Science

Aug. 2008

– Advisor: Prof. Kyoung-Mu Lee (Computer Vision)

B.S., Electrical Engineering

Feb. 2003

– Thesis Advisor: Prof. Jin Young Choi (Computer Vision)

Employment

- ✓ Assistant Professor, **GIST AI GS/EECS**, Gwangju, South Korea Aug. 2018 - Present
- ✓ Affiliated Research Scientist, **Allen Institute for Artificial Intelligence (AI2)**, Seattle, WA Aug. 2018 - Present
- Research Scientist, **Allen Institute for Artificial Intelligence (AI2)**, Seattle, WA May 2016 - July 2018
- Senior Researcher, **Comcast Applied Artificial Intelligence Research**, Washington, DC April 2015 - May 2016
- Research Intern, **Microsoft Research**, Redmond, WA. June 2014 - Sept. 2014
- Research Intern, **Disney Research**, Pittsburgh, PA. March 2014 - June 2014
- Research Intern, **Adobe Research**, San Jose, CA. May 2013 - Sept. 2013
- Research Intern, **US Army Research Lab**, Adelphi, MD. May 2011 - Aug. 2011
- Research Engineer, **Olaworks Inc.** (now Intel Korea), Seoul, South Korea. Aug. 2008 - Aug. 2009
- Engineer, **D-Gate Co.,Ltd.**, Seoul, South Korea. (Alternative military service) Jan. 2003 - March 2006

Publications

arXiv Preprints

3. Learning Architectures for Binary Networks
Dahyun Kim*, Kunal Pratap Singh*, Jonghyun Choi
arXiv Preprint 2002.06963 [Link](#)
2. ScreenerNet: Learning Self-Paced Curriculum for Deep Neural Networks
Tae-Hoon Kim, Jonghyun Choi
arXiv Preprint 1801.00904 [Link](#)
1. Comparing Apples to Apples in the evaluation of binary coding methods
Mohammad Rastegari, Shobeir Fakhraei, Jonghyun Choi, David W. Jacobs and Larry S. Davis
arXiv Preprint 1405.1005 [Link](#)

In conference proceedings and journals

21. Learning to Super Resolve Intensity Images from Events
S. Mohammad Mostafavi I., Jonghyun Choi, Kuk-Jin Yoon
IEEE/CVF **CVPR** 2020 [[Oral](#)] [Link](#)
20. Structured Set Matching Networks for One-Shot Part Labeling
Jonghyun Choi, Jayant Krishnamurthy, Aniruddha Kembhavi, Ali Farhadi
IEEE/CVF **CVPR** 2018 [[Spotlight](#)] [Link](#)
19. ActionFlowNet: Learning Motion Representation for Action Recognition
Joe Yue-Hei Ng, Jonghyun Choi, Jan Neumann, Larry S. Davis
IEEE/CVF **WACV** 2018 [[Oral](#)] [Link](#)

18. Are You Smarter Than A Sixth Grader? Textbook Question Answering for Multimodal Machine Comprehension
Aniruddha Kembhavi, Minjoon Seo, Dustin Schwenk, Jonghyun Choi, Ali Farhadi, Hannaneh Hajishirzi
IEEE/CVF **CVPR** 2017 [[Spotlight](#)] [Link](#)
17. Learning Temporal Regularity in Video Sequences
Mahmudul Hasan, Jonghyun Choi, Jan Neumann, Amit K. Roy-Chowdhury, Larry S. Davis
IEEE/CVF **CVPR** 2016 [Link](#)
16. Mining Discriminative Triplets of Patches for Fine-Grained Classification
Yaming Wang, Jonghyun Choi, Vlad I. Morariu, Larry S. Davis
IEEE/CVF **CVPR** 2016 [Link](#)
15. Knowledge Transfer with Interactive Learning of Semantic Relationships
Jonghyun Choi, Sung Ju Hwang, Leonid Sigal and Larry S. Davis
AAAI 2016 [[Oral](#)] [Link](#)
ICML Workshop on Active Learning (ALW) 2015 [Link](#)
14. Collective Image Categorization and Labeling by Matrix Factorization
Seunghoon Hong, Jonghyun Choi, Jan Feyerisl, Bohyung Han and Larry S. Davis
IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**) 2016 [Link](#)
13. Multi-Directional Multi-Level Dual-Cross Patterns for Robust Face Recognition
Changxing Ding, Jonghyun Choi, Dacheng Tao, Larry S. Davis
IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**) 2016 [Link](#)
12. Cross-modal thermal-to-visible face recognition using partial least squares regression
Shuowen Hu, Jonghyun Choi, Alex L. Chan and William Robson Schwartz
Journal of the Optical Society of America A (JOSA-A) 2015 [Link](#), [Journal Spotlight](#)
11. Towards sparse coding on cosine distance
Jonghyun Choi, Hyunjong Cho, Jungsuk Kwac and Larry S. Davis
ICPR 2014 [[Oral](#)] [Link](#)
10. Predictable Dual-View Hashing
Mohammad Rastegari, Jonghyun Choi, Shobeir Fakhraei, Hal Daumé III and Larry S. Davis
ICML 2013 [Link](#)
9. Adding Unlabeled Samples to Categories by Learned Attributes
Jonghyun Choi, Mohammad Rastegari, Ali Farhadi and Larry S. Davis
IEEE/CVF **CVPR** 2013 [Link](#)
IEEE/CVF **CVPR** Workshop on Scene Understanding (SUNw) 2013 (Invited) [Link](#)
8. Data insufficiency in Sketch Versus Face Recognition
Jonghyun Choi, Abhishek Sharma, David W. Jacobs, and Larry S. Davis
IEEE/CVF **CVPR** Workshop on Biometrics 2012. [[Oral](#)] [Link](#)
7. Face Verification Using Sparse Representation
Huimin Guo, Ruiping Wang, Jonghyun Choi, and Larry S. Davis
IEEE/CVF **CVPR** Workshop on Biometrics 2012. [[Short Oral](#)] [Link](#)
6. Thermal to Visible Face Recognition
Jonghyun Choi, Shuowen Hu, S. Susan Young, and Larry S. Davis
SPIE Conference on Defense, Securities, and Sensor (DSS) 2012 [[Oral](#)]. [Link](#)
5. Robust Pose Invariant Face Recognition using Coupled Latent Space Discriminant Analysis
Abhishek Sharma, Murad Al Haj, Jonghyun Choi, Larry S. Davis, and David W. Jacobs
Computer Vision and Image Understanding (**CVIU**) 2012 [Link](#)
4. Face Identification Using Large Feature Sets
William R. Schwartz, Huimin Guo, Jonghyun Choi and Larry S Davis
IEEE Transactions on Image Processing (**TIP**) 2012 [Link](#)
3. A Complementary Local Feature Descriptor for Face Identification
Jonghyun Choi, William R. Schwartz, Huimin Guo, and Larry S Davis
IEEE/CVF **WACV** 2012. [[Full Oral](#)] [Link](#)
2. Accurate Stereo Matching using Pixel Response Function
Jonghyun Choi and Kyoung Mu Lee
Workshop on Image Processing and Image Understanding (IPIU) 2008 [Link](#)
1. An Efficient Trinocular Rectification Method for Stereo Matching
Young-Ki Baik, Jonghyun Choi and Kyoung Mu Lee
Korea-Japan Joint Workshop on Frontiers of Computer Vision (FCV) 2007. (Sponsored by IEEE) [Link](#)

Theses

- Recognizing Visual Categories by Commonality and Diversity
Ph.D. Thesis. (Advisor: Prof. Larry S. Davis) University of Maryland, College Park. 2015 [Link](#)
◊ UMD ECE distinguished Ph.D. dissertation fellowship 2015
- Radiometric Compensation using the Relative Radiometric Response Function
Master's Thesis. (Advisor: Prof. Kyoung-Mu Lee) Graduate School, Seoul National University 2008
- Vision Based Traffic Analyzer
Bachelor's Thesis. (Thesis Advisor: Prof. Jin-Young Choi) Seoul National University 2003
◊ SNU EE Exhibition - Encouragement Award 2002

Professional Services

- **Organizer**
 - CVPR 2017 Workshop on Visual Understanding Across Modality (Charades Challenge)
- **Area Chair or Senior Program Committee**
 - WACV 2020
- **Reviewer or Program Committee**
 - CVPR 2015, 2018-2020
 - CVPR Workshop on Learning from Unlabeled Videos (LUV) 2019-2020
 - ICCV 2017, 2019
 - ECCV 2020
 - ACCV 2014, 2016, 2018
 - WACV 2017, 2018, 2019
 - IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI) 2013, 2018, 2020
 - International Journal of Computer Vision (IJCV) 2018
 - IEEE Transactions on Image Processing (TIP) 2014-2018
 - Computer Vision and Image Understanding (CVIU) 2012, 2014, 2018
 - IEEE Transactions on Circuits and Systems for Video Technology (TCSVT) 2014, 2017, 2018
 - Pattern Recognition 2014, 2018
 - Springer Journal of Signal, Image and Video Processing (SIVP) 2013
 - IEEE Transactions on Information Forensics and Security (TIFS) 2013, 2018
 - IEEE Transactions on Aerospace and Electronic Systems (TAES) 2012-2013
 - IEEE Access 2018

Awards, Honors and Scholarship

- Samsung Humantech Paper Award
 - **Bronze Prize** (as an advisor) (26th) 2020
 - **Gold Prize (First Place)** (20th) 2014
- **Winner**, Distinguished Dissertation Fellowship, Dept. of Elec. and Comp. Eng., University of Maryland March 2015
- **Graduate Scholarship**, 2014 Korean Scientist and Engineers Association (KSEA) Scholarship Aug. 2014
- **1th Place Scholarship**, 2013 Moon-Jung Chung Scholarship, Kor. Comp. Sci. Eng. Ass'n in America (KOCSEA) Dec. 2013
- **Best Presentation Award**, UMD KGSA-KSEA Annual Symposium Mar. 2013
- **Summer Research Fellowship**, Graduate School, University of Maryland (*one of 47/10,805*) May-Aug. 2012
- **Nurturing Graduate Student Scholarship**, Samsung Electronics Jan. 2007–Aug. 2008
- **Research Graduate Student Scholarship**, Korea Science Foundation (KSF) Mar. 2007–Feb. 2008
- **SNU EE-Alumni Scholarship for Graduate Study**, SNU EE-Alumni Association Sept. 2007–Feb. 2008

Teaching

- **GIST** (Gwangju Institute of Science and Technology), Instructor
 - Visual Recognition and Reasoning (AI6101 / EC6401) Spring 2020
 - Machine Learning and Deep Learning (EC4213/ET5402/ET5303) Fall 2019, Fall 2018
 - Signals and Systems (EC3202 / MC3207) Spring 2019

- **University of Maryland, College Park**, Graduate Teaching Assistant
 - Fundamental Electric and Digital Circuit Laboratory (ENEE206) Spring 2010
- **Seoul National University**, Teaching Assistant
 - Signals and Systems: Homework/Exam Grading Spring 2007
 - Programming Methodology: Recitation for C++ programming, Homework Grading Fall 2007

Funding

- Incremental Detailed Visual Recognition towards Human-like AI 2019-2022
Korean National Research Foundation (NRF) / PI / 397M KRW (350K USD)
- Dev. of Ultra Low-Power Mobile Deep Learning Semicon. With Compr./Decompr. of Actv./Kernel Data 2019-2022
MSIT Inst. of Information & Comm. Tech. Planning & Eval. (IITP) / Co-PI / 350M KRW (300K USD)
- Future Defence AI Specialized Research Center 2019-2022
Agency for Defense Development (ADD) / Co-PI / 400M KRW (350K USD)
- AI Graduate School 2019-2024
MSIT Inst. of Information & Comm. Tech. Planning & Eval. (IITP) / Co-PI / 500M KRW (450K USD)
- Retrieve video frames by a natural language query 2019
ncsoft / PI / 50M KRW (45K USD)
- Large scale product image search system – Proof of Concept 2019
Lotte Information Communication Inc. / PI / 40M KRW (35K USD)

Patent

- Method and device for neural architecture search optimized for binary neural network 2020
Dahyun Kim, Kunal Pratap Singh and **Jonghyun Choi**
◦ Korean Patent Application (10-2020-0021738).
- Object Classification Through Semantic Mapping 2017
Sung Ju Hwang, **Jonghyun Choi** and Leonid Sigal
◦ US Patent Registered (9,740,964).
- Unsupervised Initialization Method of Graph-Cut Algorithm for Human Segmentation 2010
Jonghyun Choi and Tae-hoon Kim
◦ Korean Patent Registered (10-0967379).

Advising

- Mohammad Mostafavi, Ph.D. student, GIST
- Yeonsik Jo, M.S. student, GIST
- Dongmin Kang, M.S. student, GIST
- Jinwoo Nam, M.S. student, GIST
- Yeong-oo Nam, M.S. student, GIST
- Dahyun Kim, M.S. student, GIST
- Taeil Oh, M.S. student, GIST
- Byeonghwi Kim, M.S. student, GIST
- Hyunseo Koh, M.S. student, GIST
- Jihun Kim, M.S. student, GIST
- Daechul Ahn, M.S. student, GIST
- Donggun Lee, B.S. student, GIST
- Daeun Kyung, B.S. student, GIST
- Kunal Pratap Singh, B.S. student, IIT Roorkee
- Suvaansh Bhambri, B.S. student, IIT Roorkee
- Jihwan Bae, B.S. 2020, GIST (now at ADD)

Reference will be provided upon request.