

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 and 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

Under reviewed articles

2. **BNAS: Learning Architectures for Binary Networks**
Dahyun Kim, Kunal Pratap Singh, **Jonghyun Choi**
IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**) *Under review*
1. **E2SRI: Learning to Super-Resolve Intensity Images from Events**
S. Mohammad Mostafavi I., Yeong-oo Nam, **Jonghyun Choi**, Kuk-Jin Yoon
IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**) *Under review*

Recent arXiv Preprints

1. **MOCA: A Modular Object-Centric Approach for Interactive Instruction Following**
Kunal Pratap Singh*, Suvaansh Bhambri*, Byeonghwi Kim*, Roozbeh Mottaghi, **Jonghyun Choi**
arXiv preprint [Link](#)

In conference proceedings and journals

22. **Rainbow Memory: Continual Learning with a Memory of Diverse Samples**
Jihwan Bhang*, Heesu Kim*, Youngjoon Yoo, Jungwoo Ha, **Jonghyun Choi**
CVPR 2021 (To appear)
21. **Rainbow Memory: Continual Learning with a Memory of Diverse Samples**
Jihwan Bhang*, Heesu Kim*, Youngjoon Yoo, Jungwoo Ha, **Jonghyun Choi**
CVPR 2021 (To appear)
20. **Learning Architectures for Binary Networks**
Dahyun Kim*, Kunal Pratap Singh*, **Jonghyun Choi**
ECCV 2020 [Link](#)

19. Learning to Super Resolve Intensity Images from Events
S. Mohammad Mostafavi I., Jonghyun Choi, Kuk-Jin Yoon
CVPR 2020 ([Oral](#)) [Link](#)
18. Structured Set Matching Networks for One-Shot Part Labeling
Jonghyun Choi*, Jayant Krishnamurthy*, Aniruddha Kembhavi, Ali Farhadi
CVPR 2018 ([Spotlight](#)) [Link](#)
17. ActionFlowNet: Learning Motion Representation for Action Recognition
Joe Yue-Hei Ng, Jonghyun Choi, Jan Neumann, Larry S. Davis
WACV 2018 ([Oral](#)) [Link](#)
16. 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
CVPR 2017 ([Spotlight](#)) [Link](#)
15. Learning Temporal Regularity in Video Sequences
Mahmudul Hasan, Jonghyun Choi, Jan Neumann, Amit K. Roy-Chowdhury, Larry S. Davis
CVPR 2016 [Link](#)
14. Mining Discriminative Triplets of Patches for Fine-Grained Classification
Yaming Wang, Jonghyun Choi, Vlad I. Morariu, Larry S. Davis
CVPR 2016 [Link](#)
13. 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](#)
12. Collective Image Categorization and Labeling by Matrix Factorization
Seunghoon Hong, Jonghyun Choi, Jan Feyereisl, Bohyung Han and Larry S. Davis
IEEE Transactions on Pattern Analysis and Machine Intelligence (**TPAMI**) 2016 [Link](#)
11. 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](#)
10. 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](#)
9. Towards sparse coding on cosine distance
Jonghyun Choi, Hyunjong Cho, Jungsuk Kwac and Larry S. Davis
ICPR 2014 ([Oral](#)) [Link](#)
8. Predictable Dual-View Hashing
Mohammad Rastegari, Jonghyun Choi, Shobeir Fakhraei, Hal Daumé III and Larry S. Davis
ICML 2013 [Link](#)
7. Adding Unlabeled Samples to Categories by Learned Attributes
Jonghyun Choi, Mohammad Rastegari, Ali Farhadi and Larry S. Davis
CVPR 2013 [Link](#)
CVPR Workshop on Scene Understanding (SUNw) 2013 (Invited) [Link](#)
6. Data insufficiency in Sketch Versus Face Recognition
Jonghyun Choi, Abhishek Sharma, David W. Jacobs, and Larry S. Davis
CVPR Workshop on Biometrics 2012. ([Oral](#)) [Link](#)
5. Face Verification Using Sparse Representation
Huimin Guo, Ruiping Wang, Jonghyun Choi, and Larry S. Davis
CVPR Workshop on Biometrics 2012. ([Short Oral](#)) [Link](#)
4. 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](#)
3. 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](#)
2. 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](#)
1. A Complementary Local Feature Descriptor for Face Identification

Old arXiv preprints

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](#)

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](#)

Academic Services

- **Area Chair or Senior Program Committee**
 - WACV 2020, 2021
- **Organizer**
 - CVPR 2017 Workshop on Visual Understanding Across Modality (Charades Challenge)
- **Reviewer or Program Committee**
 - CVPR 2015, 2018-2020
 - ◊ CVPR Workshop on Learning from Unlabeled Videos (LUV) 2019-2020
 - ICCV 2017, 2019
 - ECCV 2020
 - NeurIPS 2020
 - AAAI 2019, 2020, 2021
 - ACCV 2014, 2016, 2018, 2020
 - 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, Springer Journal of Signal, Image and Video Processing (SIVP), IEEE Trans. on Info. Forensics and Security (TIFS), IEEE Trans. on Aerospace and Electronic Systems (TAES), IEEE Access, and *etc.*

Teaching

- **GIST (Gwangju Institute of Science and Technology)** [Instructor](#)
 - ◊ Machine Learning and Deep Learning (AI5213 / EC4213 / ET5402 / ET5303) Fall 2018, 2019, 2020
 - ◊ Visual Recognition and Reasoning (AI6101 / EC6401) Spring 2020
 - ◊ 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

- AI Data Curation - for Drones 2020
Korean National Information Society Agency (NIA) / Co-PI / 100M KRW (85K USD)

- 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)
- Center for Applied Research in Artificial Intelligence (CARAI) 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)
- Consulting
 - Naver Clova AI / Lotte Data Comm. Inc. / Deeping Source Inc. 2020
 - NCSoft / Lotte Data Comm. Inc. 2019

Awards, Honors and Scholarship

- Samsung Humantech Paper Award
 - **Bronze Prize** (as an advisor) (26th) 2020
 - **Gold Prize** (First place) (20th) 2014
- **2nd Place Winner**, Embodied Vision, Actions & Language (EVAL) Workshop at ECCV 2020 Aug. 2020
- **Distinguished Dissertation Fellowship**, Department of ECE, University of Maryland March 2015
- **Summer Research Fellowship**, Graduate School, University of Maryland (47/10,805) May-Aug. 2012
- **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

Patent

- A method of Logit adjustment and memory management for incremental learning 2020
Dongmin Kang, Yeongwoo Nam, Yeonsik Jo, **Jonghyun Choi**
Korean Patent Application (10-2020-0138679).
- A method and apparatus for generating super resolve intensity image 2020
Mohammad Mostafavi, **Jonghyun Choi** and Kuk-Jin Yoon
Korean Patent Application (10-2020-0070044).
- A method and apparatus for neural architecture search optimized for binary neural network 2020
Dahyun Kim, Kunal Pratap Singh and **Jonghyun Choi**
US Patent Application (17105988). Korean Patent Registered (10-2140996).
- Object Classification Through Semantic Mapping 2017
Sung Ju Hwang, **Jonghyun Choi** and Leonid Sigal
US Patent Registered (9740964).
- 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
- 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
- Jimin Sohn, M.S. student, GIST
- Daeun Kyung, B.S. student, GIST
- Kunal Pratap Singh, B.S. student, IIT Roorkee
- Suvaansh Bhambri, B.S. student, IIT Roorkee

Past

- Yeonsik Jo, M.S. 2021, GIST
- Dongmin Kang, M.S. 2021, GIST
- Jinwoo Nam, M.S. 2021, GIST
- Donggun Lee, B.S. 2020, GIST

- Jihwan Bae, B.S. 2020, GIST (now at ADD)

Reference will be provided upon request.