

# Jonghyun Choi

123 Cheomdangwagi-ro, Dasan 509  
Buk-gu, Gwangju 61005, South Korea

e-mail: [jhc@gist.ac.kr](mailto:jhc@gist.ac.kr)  
webpage: <http://ppolon.github.io>

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

## Research Interest

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**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

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### 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

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- ✓ 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

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### 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

21. **Rainbow Memory: Continual Learning with a Memory of Diverse Samples**  
Jihwan Bang\*, Heesu Kim\*, Youngjoon Yoo, Jung-Woo 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, Security, 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  
Jonghyun Choi, William R. Schwartz, Huimin Guo, and Larry S Davis  
**WACV 2012. (Full Oral)** [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](#)

## 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

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- **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

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- **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

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- 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

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- Samsung Humantech Paper Award
  - **Bronze Prize** (as an advisor) (26<sup>th</sup>) 2020
  - **Gold Prize** (First place) (20<sup>th</sup>) 2014
- **2<sup>nd</sup> 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

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- 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

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- 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

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- 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.