

# 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

---

**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

---

### 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  
**CVPR 2020 (Oral)** [Link](#)
20. Structured Set Matching Networks for One-Shot Part Labeling  
Jonghyun Choi, Jayant Krishnamurthy, Aniruddha Kembhavi, Ali Farhadi  
**CVPR 2018 (Spotlight)** [Link](#)
19. ActionFlowNet: Learning Motion Representation for Action Recognition  
Joe Yue-Hei Ng, Jonghyun Choi, Jan Neumann, Larry S. Davis  
**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  
**CVPR 2017 (Spotlight)** [Link](#)

17. Learning Temporal Regularity in Video Sequences  
Mahmudul Hasan, Jonghyun Choi, Jan Neumann, Amit K. Roy-Chowdhury, Larry S. Davis  
**CVPR** 2016 [Link](#)
16. Mining Discriminative Triplets of Patches for Fine-Grained Classification  
Yaming Wang, Jonghyun Choi, Vlad I. Morariu, Larry S. Davis  
**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  
**CVPR** 2013 [Link](#)  
**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  
**CVPR Workshop on Biometrics** 2012. [\(Oral\) Link](#)
7. Face Verification Using Sparse Representation  
Huimin Guo, Ruiping Wang, Jonghyun Choi, and Larry S. Davis  
**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  
**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) (26<sup>th</sup>) 2020
  - **Gold Prize (First Place)** (20<sup>th</sup>) 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
- **1<sup>th</sup> Place Scholarship**, 2013 Moon-Jung Chung Scholarship, Kor. Comp. Sci. Eng. Ass'n in America (KOCSEA) Dec. 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 Data Communications 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.