Jonghyun Choi

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

e-mail: 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

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*

In conference proceedings and journals

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**[CA], 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**[CA], 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 Workhop 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
   Jonghyun Choi, William R. Schwartz, Huimin Guo, and Larry S Davis
   WACV 2012. **(Full Oral)** Link

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
  Bacholor's Thesis. (Thesis Advisor: Prof. Jin-Young Choi) Seoul National University 2003
  ◇ SNU EE Exhibition - Encouragement Award 2002

Professional 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
- 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

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

Reference will be provided upon request.