Jonghyun Choi

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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

✓ **My name in bold underline** denotes main author (*i.e.,* first or corresponding author).

In conference proceedings and journals

28. Iconary: A Pictionary-based Game for Testing Multimodal Communication with Drawings and Text
Christopher Clark, Jordi Salvador, Dustin Schwenk, Derrick Bonafilia, Mark Yatskar, Eric Kolve, Alvaro Herrasti, **Jonghyun Choi**, Sachin Mehta, Sam Skjonsberg, Carissa Schoenick, Aaron Sarnat, Hannaneh Hajishirzi, Aniruddha Kembhavi, Oren Etzioni and Ali Farhadi
EMNLP 2021 (Long) **(Oral)** (Accepted)

27. Zero-Shot Natural Language Video Localization
Jinwoo Nam, Daechul Ahn, Dongyeop Kang, Seong Jong Ha, **Jonghyun Choi**
ICCV 2021 **(Oral)** (Accepted, ratio: 3.4%)

26. Rethinking Deep Image Prior for Denoising
Yeonsik Jo, Se Young Chun, **Jonghyun Choi**
ICCV 2021 (Accepted)

25. Event-Intensity Stereo: Estimating Depth by the Best of Both Worlds
S. Mohammad Mostafavi I., Kuk-Jin Yoon, **Jonghyun Choi**
ICCV 2021 (Accepted) / 2021 CVPR Event Vision Workshop Challenge - 1st place winner.

24. Factorizing Perception and Policy for Interactive Instruction Following
Kunal Pratap Singh*, Suvaansh Bhambri*, Byeonghwi Kim*, Roozbeh Mottaghi, **Jonghyun Choi**
ICCV 2021 (Accepted) / 2021 CVPR Embodied Vision Workshop Challenge - 2nd place winner.

23. 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**) 2021 (Accepted)

22. Rainbow Memory: Continual Learning with a Memory of Diverse Samples
Jihwan Bang*, Heesu Kim*, Youngjoon Yoo, Jung-Woo Ha, **Jonghyun Choi**
CVPR 2021 Link

21. Acceleration of Semiconductor Device Simulation with Approximate Solutions Predicted by Trained Neural Networks
Seung-Cheol Han, **Jonghyun Choi**, Sung-Min Hong
IEEE Transactions on Electron Devices 2021 Link

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

- **Organizer**
  - ACCV 2022 Industry Chair
  - CVPR 2017 Workshop on Visual Understanding Across Modality (Charades Challenge)
- **Area Chair or Senior Program Committee**
  - AAAI 2022
  - WACV 2020-2022
- **Reviewer or Program Committee**
  - CVPR 2015, 2018-2022
    - CVPR Workshop on Learning from Unlabeled Videos (LUV) 2019-2020
  - ICCV 2017-2021
  - ECCV 2020
  - NeurIPS 2020-2021
    - NeurIPS 2021 Workshop on ImageNet: Past, Present, and Future
  - ICLR 2021
  - AAAI 2019-2021
  - ACCV 2014-2020
  - WACV 2017-2019
  - 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

Awards, Honors and Scholarship

- **1st Place Winner**, Event vision challenge at CVPR 2021 — June 2021
- **2nd Place Winner**, Embodied vision workshop – 'ALFRED' challenge at CVPR 2021 — June 2021
- 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

- Yeong-oo Nam, Ph.D. student, GIST (Now, invited internship at NAVER AI)
- Dahyun Kim, M.S. student, GIST (Now, invited internship at NAVER AI)
- Taeil Oh, M.S. student, GIST
- Byeonghwi Kim, M.S. student, GIST (Now, invited internship at AI2, Seattle, WA)
- Hyunseo Koh, M.S. student, GIST (Now, invited internship at NAVER AI)
- Jihun Kim, M.S. student, GIST
- Daechul Ahn, M.S. student, GIST (Now, invited internship at LG AI Research)
- Jimin Sohn, M.S. student, GIST
- Hyungrok Jung, M.S. student, GIST
- Suvaansh Bhambri, B.S. student, IIT Roorkee

Past

- Daeun Kyung, B.S. 2021, GIST → KAIST AIGS
- Mohammad Mostafavi, Ph.D. 2021, GIST. (co-advised with Prof. Kuk-Jin Yoon @ KAIST) → Research scientist @ Lunit
- Kunal Pratap Singh, B.S. 2020, IIT Roorkee → Pre-doctoral young investigator @ AI2
- Yeonsik Jo, M.S. 2021, GIST → Research engineer @ LG AI Research

- Dongmin Kang, B.S. 2019, M.S. 2021, GIST → GIST AI Research (Mil. Oblig.)
- Jinwoo Nam, B.S. 2019, M.S. 2021, GIST → Knowre Inc. (Mil. Oblig.)
- Donggun Lee, B.S. 2020, GIST → POSTECH Graphics Lab.
- Jihwan Bae, B.S. 2020, GIST → ADD (Mil. Oblig.)

Reference will be provided upon request.