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

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

In conference proceedings and journals

22. Learning Architectures for Binary Networks
    Dahyun Kim*, Kunal Pratap Singh*, **Jonghyun Choi**
    ECCV 2020 Link (arXiv prepring)

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 Feyereisl, 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 Workhop 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
  Bacholor'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, 2021
- **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
  - 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^{th}) 2020
  - **Gold Prize** (First Place) (20^{th}) 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^{th} 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)
- 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)
- 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

- A method and apparatus for generating super resolve intensity image 2020
  Mohammad Mostafavi, **Jonghyun Choi**, 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**
  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

Past

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

Reference will be provided upon request.