# Jonghyun Choi

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## Research Interest

**Building a practical multi-modal perception system** using computer vision and machine learning, particularly efficient in labeling cost and computational complexity of training and inference.

## Employment

- ✓ Associate Professor, **Seoul National University**, Seoul, South Korea — Mar. 2024 - Present
  - Department of Electrical and Computer Engineering — Mar. 2024 - Present
  - Deputy head, Interdisciplinary Program of Artificial Intelligence (IPAI) — April 2024 - Present
- Associate Professor, **Yonsei University**, Department of AI/CS, Seoul, South Korea — Mar. 2022 - Feb. 2024
  - Adjuct Professor, **POSTECH**, Graduate School of AI, Pohang, South Korea — Sept. 2022 - Feb. 2024
- Assistant Professor, **GIST AI GS/EECS**, Gwangju, South Korea — Aug. 2018 - Feb. 2022
- 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
- Graduate Research Assistant, **UMIACS, University of Maryland**, College Park, MD — May 2010 - April. 2015
- 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

## 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)

## Publications

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

**In conference proceedings and journals**

51. Pre-emptive Action Revision by Environmental Feedback for Embodied Instruction Following Agents
    Jinyeon Kim, Cheolhong Min, Byeonghwi Kim, **Jonghyun Choi**
    **CoRL** 2024 Link
50. ReALFRED: Interactive Instruction Following Benchmark in Photo-Realistic Environments
    Taewoong Kim, Cheolhong Min, Byeonghwi Kim, Jinyeon Kim, Wonje Jeung, **Jonghyun Choi**
    **ECCV** 2024 Link
49. SyncVSR: Data-Efficient Visual Speech Recognition with End-to-End Crossmodal Audio Token Synchronization
    Young Jin Ahn, Jungwoo Park, Sangha Park, Jonghyun Choi, Kee-Eung Kim
    **Interspeech** 2024 Link
48. Tuning Large Multimodal Models for Videos using Reinforcement Learning from AI Feedback
    Daechul Ahn, Yura Choi, Youngjae Yu, Dongyeop Kang, **Jonghyun Choi**
    **ACL** 2024 **(Oral)** Link

47. DataFreeShield: Defending Adversarial Attacks without Training Data
Hyeyoon Lee, Kanghyun Choi, Dain Kwon, SunJong Park, Mayoore Selvarasa Jaiswal, Noseong Park, Jonghyun Choi, Jinho Lee
**ICML** 2024 Link

46. Learning Equi-angular Representations for Online Continual Learning
Minhyuk Seo, Hyunseo Koh, Wonje Jeung, Min Jae Lee, San Kim, Hankook Lee, Sungjun Cho, Sungik Choi, Hyunwoo Kim, **Jonghyun Choi**
**CVPR** 2024 Link

45. Online Continual Learning for Interactive Instruction Following Agents
Byeonghwi Kim, Minhyuk Seo, **Jonghyun Choi**
**ICLR** 2024 Link

44. PAC-FNO: Parallel-Structured All-Component Fourier Neural Operators for Recognizing Low-Quality Images
Jinsung Jeon, Hyundong Jin, **Jonghyun Choi**, Sanghyun Hong, Dongeun Lee, Kookjin Lee, Noseong Park
**ICLR** 2024 Link

43. Operator-learning-inspired Modeling of Neural Ordinary Differential Equations
Woojin Cho, Seunghyeon Cho, Hyundong Jin, Jinsung Jeon, Kookjin Lee, Sanghyun Hong, Dongeun Lee, Jonghyun Choi, Noseong Park
**AAAI** 2024 Link

42. Context-Aware Planning and Environment-Aware Memory for Instruction Following Embodied Agents
Byeonghwi Kim, Jinyeon Kim, Yuyeong Kim, Cheolhong Min, **Jonghyun Choi**
**ICCV** 2023 Link / 2023 CVPR Embodied AI Challenge - 1st place winner Link

41. Story Visualization by Online Text Augmentation with Context Memory
Daechul Ahn, Daneul Kim, Gwangmo Song, Seung Hwan Kim, Honglak Lee, Dongyeop Kang, **Jonghyun Choi**
**ICCV** 2023 Link

40. Online Continual Learning on Hierarchical Label Expansion
Byung Hyun Lee, Okchul Jung, **Jonghyun Choi**, Se Young Chun
**ICCV** 2023 Link

39. Cost-effective On-device Continual Learning over Memory Hierarchy with Miro
Xinyue Ma, Suyeon Jeong, Minjia Zhang, Di Wang, **Jonghyun Choi**, Myeongjae Jeon
**MobiCom** 2023 **(Oral)** Link

38. Online Boundary-Free Continual Learning by Scheduled Data Prior
Hyunseo Koh, Minhyuk Seo, Jihwan Bang, Hwanjun Song, Deokki Hong, Seulki Park, Jung-Woo Ha, **Jonghyun Choi**
**ICLR** 2023 Link

37. Multi-level Compositional Reasoning for Interactive Instruction Following
Suvaansh Bhambri*, Byeonghwi Kim*, **Jonghyun Choi**
**AAAI** 2023 **(Oral)** Link

36. Learning visual representations for transfer learning by suppressing texture
Shlok Mishra, Anshul Shah, Ankan Bansal, Janit Anjaria, **Jonghyun Choi**, Abhinav Shrivastava, Abhishek Sharma, David Jacobs
**BMVC** 2022 Link

35. Ask4Help: Learning to Leverage an Expert for Embodied Tasks
Kunal Pratap Singh, Luca Weihs, Alvaro Herrasti, **Jonghyun Choi**, Aniruddha Kembhavi, Roozbeh Mottaghi
**NeurIPS** 2022 Link

34. CarM: Rethinking the Design of Episodic Memory for Continual Learning
Soobee Lee, Minindu Weerakoon, **Jonghyun Choi**, Minjia Zhang, Di Wang, Myeongjae Jeon
**DAC** 2022 Link

33. Unsupervised Representation Learning for Binary Networks by Joint Classifier Training
Dahyun Kim, **Jonghyun Choi**
**CVPR** 2022 Link

32. Online Continual Learning on a Contaminated Data Stream with Blurry Task Boundaries
Jihwan Bang, Hyunseo Koh, Seulki Park, Hwanjun Song, Jung-Woo Ha, **Jonghyun Choi**
**CVPR** 2022 Link

31. Stereo Depth from Events Cameras: Concentrate and Focus on the Future
YeongWoo Nam, Mohammad Mostafavi, Kuk-Jin Yoon, **Jonghyun Choi**
**CVPR** 2022 Link

30. Attentive Fine-Grained Structured Sparsity for Image Restoration
Junghun Oh, Heewon Kim, Seungjun Nah, Cheeun Hong, **Jonghyun Choi**, Kyoung Mu Lee
**CVPR** 2022 Link

29. Online Continual Learning on Class Incremental Blurry Task Configuration with Anytime Inference
Hyunseo Koh*, Dahyun Kim*, Jung-Woo Ha and **Jonghyun Choi**
**ICLR** 2022 Link

28. Unsupervised Domain Adaptation for 3D Point Clouds by Searched Transformations
Dongmin Kang, Yeongwoo Nam, Daeun Kyung, **Jonghyun Choi**
IEEE Access 2022 Link

27. 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)** Link

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

25. Rethinking Deep Image Prior for Denoising
Yeonsik Jo, Se Young Chun, **Jonghyun Choi**
**ICCV** 2021 Link

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

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

22. 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 Link

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

20. 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

19. Learning Architectures for Binary Networks
Dahyun Kim*, Kunal Pratap Singh*, **Jonghyun Choi**
**ECCV** 2020 Link

18. Learning to Super Resolve Intensity Images from Events
S. Mohammad Mostafavi I., **Jonghyun Choi**, Kuk-Jin Yoon
**CVPR** 2020 **(Oral)** Link

17. Confidence Calibration for Incremental Learning
Dongmin Kang, Yeonsik Jo, Yeongwoo Nam, **Jonghyun Choi**
IEEE Access 2020 Link

16. Structured Set Matching Networks for One-Shot Part Labeling
**Jonghyun Choi**, Jayant Krishnamurthy, Aniruddha Kembhavi, Ali Farhadi
**CVPR** 2018 **(Spotlight)** Link

15. ActionFlowNet: Learning Motion Representation for Action Recognition
Joe Yue-Hei Ng, **Jonghyun Choi**, Jan Neumann, Larry S. Davis
**WACV** 2018 **(Oral)** Link

14. 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

13. Learning Temporal Regularity in Video Sequences
Mahmudul Hasan, **Jonghyun Choi**[CA], Jan Neumann, Amit K. Roy-Chowdhury, Larry S. Davis
**CVPR** 2016 Link

12. Mining Discriminative Triplets of Patches for Fine-Grained Classification
Yaming Wang, **Jonghyun Choi**[CA], Vlad I. Morariu, Larry S. Davis
**CVPR** 2016 Link

11. 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

10. 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

9. 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
8. 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
7. Towards sparse coding on cosine distance
**Jonghyun Choi**, Hyunjong Cho, Jungsuk Kwac and Larry S. Davis
**ICPR** 2014 **(Oral)** Link
6. Predictable Dual-View Hashing
Mohammad Rastegari, **Jonghyun Choi**, Shobeir Fakhraei, Hal Daumé III and Larry S. Davis
**ICML** 2013 Link
5. 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
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

**In workshop proceedings**

4. MEnsA: Mix-up Ensemble Average for Unsupervised Multi Target Domain Adaptation on 3D Point Clouds
Ashish Sinha, **Jonghyun Choi**
**CVPR** 2023 Workshop on Continual Learning. Link
3. Language Guided Meta-Control for Embodied Instruction Following
Divyam Goel, Kunal Pratap Singh, **Jonghyun Choi**
**CVPR** 2022 Workshop - Embodied AI Workshop. Link
2. Data insufficiency in Sketch Versus Face Recognition
**Jonghyun Choi**, Abhishek Sharma, David W. Jacobs, and Larry S. Davis
**CVPR** 2012 Workshop on Biometrics. **(Oral)** Link
1. Face Verification Using Sparse Representation
Huimin Guo, Ruiping Wang, **Jonghyun Choi**, and Larry S. Davis
**CVPR** 2012 Workshop on Biometrics. **(Short Oral)** Link

**Non-peer reviewed 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 Link

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

## Professional Services

- **Organizer**
  - CoRL 2025 Sponsorship Chair
  - WACV 2025 Workshop Chair
  - CoLLAs 2023 Review Process Chair
  - ACCV 2022 Industry Chair
  - CVPR 2017 Workshop on Visual Understanding Across Modality (Charades Challenge)
- **Associate Editor**
  - IEEE Transactions of Pattern Analysis and Machine Intelligence (TPAMI)
  - ICRA 2025
- **Area Chair or Senior Program Committee**
  - CVPR 2023-2025
  - NeurIPS 2023-2024 (Main, D&B Track)
  - BMVC 2023-2024
  - AAAI 2022-2025
  - WACV 2020-2024
- **Reviewer or Program Committee**
  - CVPR 2015, 2018-2022
  - ICCV 2017-2022
  - ECCV 2020-2022
  - NeurIPS 2020-2022
  - ICLR 2022-2023
  - ICML 2021-2023
  - AAAI 2019-2021
  - BMVC 2022
  - 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 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 2018-2020
- **Local Service (Chairs/President selected)**
  - Program Chair, KCCV 2023
  - President, CVPR research society, KIISE, 2023-Present

## Awards, Honors and Scholarship

- $1^{st}$ **Place Winner**, Visual Continual Learning Workshop – SHIFT Challenge 2023 - Continuous Test-time Adaptation for Object Detection at ICCV 2023 Oct. 2023
- $1^{st}$ **Place Winner**, Embodied AI workshop – Generalist Language Grounding Agents Challenge at CVPR 2023 June 2023
- **Outstanding CVPR researcher**, Korean Institute of Information Scientists and Engineers (KIISE) Dec. 2022
- $1^{st}$ **Place Winner**, Event vision challenge at CVPR 2021 June 2021
- $2^{nd}$ **Place Winner**, Embodied AI workshop – 'ALFRED' challenge at CVPR 2021 June 2021
- Samsung Humantech Paper Award
  - **Bronze Prize** (as an advisor) ($26^{th}$) 2020

  - **Gold Prize** (First place) ($20^{th}$) 2014
- **$2^{nd}$ 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

Reference will be provided upon request.