Jaehong Yoon

CONTACT INFORMATION

KAIST, South Korea
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LINKS: HOMEPAGE, GOOGLE SCHOLAR, TWITTER

RESEARCH INTERESTS

My research interest mainly focuses on developing **lifelong and meta-cognitive algorithms** for tackling practical challenges in deploying **on-device artificial general intelligence system to various real-world application domains**. I've been focusing on bridging my research experience to relevant research areas, such as open-world problems, online/streaming learning, reinforcement learning, multimodal, and language models. I currently focus on the following topics:

- Lifelong Machine learning: Online Learning, Continual Learning
- Collective Machine Intelligence: On-device Learning, Federated Learning
- Learning with incomplete data: Un-/Self-supervised Learning, Coreset Selection
- Low-resource learning: Network Compression, Quantization

EDUCATION

KAIST, Daejeon, South Korea

Ph.D. student, School of Computing, **Aug 2018 - Current**

- Machine Learning and Artificial Intelligence (MLAI) Lab
- Adviser: Sung Ju Hwang
- Area of Study: Machine Learning
- Anticipated Graduation Date: **Feb 2023**

UNIST, Ulsan, South Korea

M.S., Computer Science, Aug 2016 - Feb 2018

- Thesis: *Combined Group and Exclusive Sparsity for Deep Neural Networks*
- Adviser: Sung Ju Hwang
- Area of Study: Machine Learning

B.S., Computer Science Engineering, Mar 2012 - Aug 2016

- Biological Science Minor

RESEARCH EXPERIENCE

Microsoft Research, Beijing, China

RESEARCH INTERNSHIP Nov 2021 - Apr 2022

- Visual Computing Group
- Research topic: Vision transformer-based Continual Representation Learning
- Mentor: **Yue Cao**

MLAI Lab., KAIST, Daejeon, South Korea

CONTRACT RESEARCH SCIENTIST Feb 2018 - Aug 2018

- Research topic: Efficient data sampling to accelerate the convergence

AITRICS, Seoul, South Korea

RESEARCH INTERNSHIP Mar 2018 - May 2018

- Research topic: Structured weight transformation for continual learning

*: equal contribution

Conference Publications

[C9] **Forgetting-free Continual Learning with Winning Subnetworks**
Haeyong Kang, Rusty John Lloyd Mina, Sultan Rizky Hikmawan Madjid, **Jaehong Yoon**, Chang D. Yoo, Sung Ju Hwang, and Mark Hasegawa-Johnson
International Conference on Machine Learning **(ICML) 2022**, Baltimore, MD

[C8] **Bitwidth Heterogeneous Federated Learning with Progressive Weight Dequantization**
Jaehong Yoon*, Geon Park*, Wonyong Jeong, and Sung Ju Hwang
International Conference on Machine Learning **(ICML) 2022**, Baltimore, MD

[C7] **Rethinking the Representational Continuity: Towards Unsupervised Continual Learning**
Divyam Madaan, **Jaehong Yoon**, Yuanchun Li, Yunxin Liu, and Sung Ju Hwang
International Conference on Machine Learning **(ICLR) 2022**, Virtual
Oral Presentation (Acceptance Rate = 54/3391 = 1.6%)

[C6] **Online Coreset Selection for Rehearsal-based Continual Learning**
Jaehong Yoon, Divyam Madaan, Eunho Yang, and Sung Ju Hwang
International Conference on Machine Learning **(ICLR) 2022**, Virtual

[C5] **Federated Continual Learning with Weighted Inter-client Transfer**
Jaehong Yoon*, Wonyong Jeong*, Giwoong Lee, Eunho Yang, and Sung Ju Hwang
International Conference on Machine Learning **(ICML) 2021**, Virtual

[C4] **Federated Semi-supervised Learning with Inter-Client Consistency & Disjoint Learning**
Wonyong Jeong, **Jaehong Yoon**, Eunho Yang, and Sung Ju Hwang
International Conference on Learning Representations **(ICLR) 2021**, Virtual

[C3] **Scalable and Order-robust Continual Learning with Additive Parameter Decomposition**
Jaehong Yoon, Saehoon Kim, Eunho Yang, and Sung Ju Hwang
International Conference on Learning Representations **(ICLR) 2020**, Addis ababa, Ethiopia, Virtual

[C2] **Lifelong Learning with Dynamically Expandable Networks**
Jaehong Yoon, Eunho Yang, Jeongtae Lee, and Sung Ju Hwang
International Conference on Learning Representations **(ICLR) 2018**, Vancouver, Canada

[C1] **Combined Group and Exclusive Sparsity for Deep Neural Networks**
Jaehong Yoon and Sung Ju Hwang
International Conference on Machine Learning **(ICML) 2017**, Sydney, Australia

Preprints

[P2] **Rapid Structural Pruning of Neural Networks with Set-based Task-Adaptive Meta-Pruning**
Minyoung Song, **Jaehong Yoon**, Eunho Yang, and Sung Ju Hwang
arXiv:2006.12139, 2020.

[P1] **Adaptive Network Sparsification with Dependent Beta-Bernoulli Dropout**
Juho Lee, Saehoon Kim, **Jaehong Yoon**, Haebeom Lee, Eunho Yang, and Sung Ju Hwang
arXiv:1805.10896, 2018.

Workshop Presentations

[W2] **Federated Semi-supervised Learning with Inter-client Consistency**
Wonyong Jeong, **Jaehong Yoon**, Eunho Yang, and Sung Ju Hwang
ICML Workshop on Federated Learning for User Privacy and Data Confidentiality, ICML 2020 **(Long Presentation)**, **(Best Student Paper Award)**

[W1] **Federated Continual Learning with Weighted Inter-client Transfer**
Jaehong Yoon*, Wonyong Jeong*, Giwoong Lee, Eunho Yang, and Sung Ju Hwang
ICML Workshop on Lifelong Machine Learning, ICML 2020

Patents (US only)

Method and Apparatus with Neural Network and Training
Jaehong Yoon, Saehoon Kim, Eunho Yang, and Sung Ju Hwang
US 20210256374 A1, Aug 2021

Electronic Apparatus and Method for Re-learning Trained Model
Jaehong Yoon, Eunho Yang, Jeongtae Lee, and Sung Ju Hwang
US 20180357539 A1, Dec 2018

Reviewer Services

International Conferences

- 2022 *Conference on Lifelong Learning Agents* (CoLLAs)
- 2019 – 2022 *International Conference on Machine Learning* (ICML)
- 2019 – 2022 *International Conference on Learning Representations* (ICLR)
- 2018 – 2021 *Neural Information Processing System* (NeurIPS)
- 2020 *International Joint Conferences on Artificial Intelligence* (IJCAI)
- 2020 *Association for the Advancement of Artificial Intelligence* (AAAI)

International Journals

- 2022 *Journal of Artificial Intelligence Research* (JAIR)
- 2020, 2022 *IEEE Transactions on Neural Networks and Learning Systems* (TNNLS)
- 2021 *IEEE Transactions on Pattern Analysis and Machine Intelligence* (TPAMI)
- 2021 *IEEE/ACM Transactions on Networking* (ToN)
- 2020 *Neural Networks*

Awards

NAVER Ph.D. Fellowship Award, 2017

Invited Talks

Representational Continuity for Unsupervised Continual Learning

- Korea Computer Congress (KCC), 2022

Lifelong Learning with Dynamically Expandable Networks

- Samsung SDS, 2019
- Tech. Talk from NAVER Corp., 2018

- Tech. Open Connect (T-T.O.C) from SK-Telecom, 2018

Combined Group and Exclusive Sparsity for Deep Neural Networks

- Korea Software Congress (KSC), 2017

References

- **Prof. Sung Ju Hwang**, Professor, KAIST
  Email: sjhwang82@kaist.ac.kr

- **Prof. Eunho Yang**, Associate Professor, KAIST
  Email: eunhoy@kaist.ac.kr

- **Dr. Yue Cao**, Senior Researcher, Mircosoft Research Asia
  Email: yue.cao@microsoft.com