Sung Ju Hwang

Contact Information

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Research Interests

My research interest mainly focuses on developing novel models and algorithms for tackling practical challenges in deploying artificial intelligent systems to various real-world application domains. I am currently interested in the following topics:

- **Low-resource learning:** meta-learning, network pruning & quantization, few-shot classification & generation, self-supervised and semi-supervised learning.
- **On-device learning:** network compression (pruning, quantization, and knowledge distillation), continual learning, federated learning.
- **Safe and secure learning:** uncertainty modeling & quantification, robustness to distributional shifts, defense against adversarial attacks.
- **Large-scale learning:** meta-learning, neural architecture search, distributed optimization and federated learning.

The application domains of interests include but are not limited to visual recognition (real-time vision, few-shot image classification and generation), natural language understanding (low-resource language models, question answering/generation, dialogue agents), speech recognition & synthesis, automatic drug/material discovery, healthcare and finance.

Professional Experience

KAIST

KAIST Endowed Chair Professor	**03/01/2022 - Current**
Associate Professor	**03/01/2020 - Current**
Assistant Professor	**01/01/2018 - 02/29/2020**

UNIST

Assistant Professor	**08/26/2014 - 12/31/2017**

Disney Research

Postdoctoral Research Associate	**09/16/2013 - 08/24/2014**

Education

The University of Texas at Austin, Austin, Texas USA

Ph.D., Computer Science, Aug 2013

- Thesis: *Discriminative Object Categorization with External Semantic Knowledge*
- Advisor: Professor Kristen L. Grauman
- Area of Study: Machine Learning and Computer Vision

M.A., Computer Science, May 2010

- Thesis: *Reading Between the Lines: Object Localization Using Implicit Cues from Image Tags*
- Advisor: Professor Kristen L. Grauman
- Area of Study: Computer Vision

Seoul National University, Seoul, Korea

B.S., Computer Science and Engineering, February 2008

- *Magna Cum Laude*, With Honors in Engineering

Professional Services

Area Chair

- 2020, 2021, 2022, 2023 International Conference on Machine Learning **(ICML)**
- 2021, 2022, 2023 Conference on Neural Information Processing Systems **(NeurIPS)**
- 2021, 2022, 2023 International Conference on Learning Representations **(ICLR)**
- 2022, 2023 AAAI Conference on Artificial Intelligence **(AAAI)**
- 2021 International Joint Conference on Artificial Intelligence **(IJCAI)**
- 2020 Asian Conference on Machine Learning **(ACML)**

Senior Program Committee

- 2020, 2021 AAAI Conference on Artificial Intelligence **(AAAI)**
- 2020 International Joint Conference on Artificial Intelligence **(IJCAI)**

Organizing Committee

- Second Conference on Lifelong Learning Agents **(CoLLAs)**
- 2019 ICCV Workshop on Interpreting and Explaining Visual Artificial Intelligence Models **(VXAI)**
- 2017, 2018 Korean Conference on Computer Vision **(KCCV)**

Journal Publications

[j3] Learning the Compositional Domains for Generalized Zero-shot Learning, H. Dong, Y. Fu, **S. J. Hwang**, L. Sigal and X. Xue, Computer Vision and Image Understanding **(CVIU)**, May 2022

[j2] Learning the Relative Importance of Objects from Tagged Images for Retrieval and Cross-Modal Search, **S. J. Hwang** and K. Grauman
International Journal of Computer Vision **(IJCV) (IF=5.428)**, Oct 2011.

[j1] Reading Between the Lines: Object Localization Using Implicit Cues from Image Tags, **S. J. Hwang** and K. Grauman,
IEEE Transaction on Pattern Analysis and Machine Intelligence **(TPAMI) (IF=6.085)**, Jun 2012.

Conference Publications

[**c118**] **Learning to Verify Knowledge-Augmented Language Models**, J. Baek, S. Jeong, M. Kang, J. C. Park and **S. J. Hwang**
Conference on Empirical Methods in Natural Language Processing **(EMNLP) 2023**, Singapore

[**c117**] **Co-training and Co-distillation for Quality Improvement and Compression of Language Models**, H. Lee, R. Hou, J. Kim, D. Liang, H. Zhang, **S. J. Hwang** and A. Min
Findings of the Empirical Methods in Natural Language Processing **(Findings of EMNLP) 2023**, Singapore

[c116] **Test-Time Self-Adaptive Small Language Models for Question Answering**, S. Jeong, J. Baek, S. Cho, **S. J. Hwang** and J. C. Park
Findings of the Empirical Methods in Natural Language Processing **(Findings of EMNLP) 2023**, Singapore

[c115] **Knowledge-Augmented Reasoning Distillation for Small Language Models in Knowledge-Intensive Tasks**, M. Kang, S. Lee, J. Baek, K. Kawaguchi and **S. J. Hwang**
Conference on Neural Information Processing Systems **(NeurIPS) 2023**, New Orleans, LA

[c114] **Generalizable Lightweight Proxy for Robust NAS against Diverse Perturbations**, H. Ha, M. Kim and **S. J. Hwang**
Conference on Neural Information Processing Systems **(NeurIPS) 2023**, New Orleans, LA

[c113] **Effective Targeted Attacks for Adversarial Self-Supervised Learning**, M. Kim, H. Ha, S. Son and **S. J. Hwang**
Conference on Neural Information Processing Systems **(NeurIPS) 2023**, New Orleans, LA

[c112] **STXD: Structural and Temporal Cross-Modal Distillation for Multi-View 3D Object Detection**, S. Jang, D. U. Jo, **S. J. Hwang**, D. Lee and D. Ji
Conference on Neural Information Processing Systems **(NeurIPS) 2023**, New Orleans, LA

[c111] **Text-Conditioned Sampling Framework for Text-to-Image Generation with Masked Generative Models**, J. Lee, S. Jang, J. Jo, J. Yoon, Y. Kim, J-H. Kim, J-W. Ha, and **S. J. Hwang**
International Conference on Computer Vision **(ICCV), 2023**, Paris, France

[c110] **ZET-Speech: Zero-shot adaptive Emotion-controllable Text-to-Speech Synthesis with Diffusion and Style-based Models**, M. Kang, W. Han, **S. J. Hwang**, and E. Yang
Interspeech 2023, Dublin, Ireland

[c109] **Direct Fact Retrieval from Knowledge Graphs without Entity Linking**, J. Baek, A. F. Aji, J. Lehmann, and **S. J. Hwang**
Association for Computational Linguistics **(ACL), 2023 (long paper)**, Toronto, Canada

[c108] **Language Detoxification with Attribute-Discriminative Latent Space**, J. Kwak, M. Kim, and **S. J. Hwang**
Association for Computational Linguistics **(ACL), 2023 (long paper)**, Toronto, Canada

[107] **A Study on Knowledge Distillation from Weak Teacher for Scaling Up Pre-trained Language Model**, H. Lee, R. Hou, J. Kim, D. Liang, **S. J. Hwang**,

and A. Min
Findings of Association for Computational Linguistics 2023, Toronto, Canada

[c106] **Phrase Retrieval for Open Domain Conversational Question Answering with Conversational Dependency Modeling via Contrastive Learning**, S. Jeong, J. Baek, **S. J. Hwang**, and J. C. Park
Findings of Association for Computational Linguistics 2023, Toronto, Canada

[c105] **Exploring Chemical Space with Score-based Out-of-distribution Generation**, S. Lee, J. Jo, and **S. J. Hwang**
International Conference on Machine Learning **(ICML), 2023**, Honolulu, HI

[c104] **Scalable Set Encoding with Universal Mini-Batch Consistency and Unbiased Full Set Gradient Approximation**, J. Willette, S. Lee, B. Andreis, K. Kawaguchi, J. Lee, and **S. J. Hwang**
International Conference on Machine Learning **(ICML), 2023**, Honolulu, HI

[c103] **Personalized Subgraph Federated Learning**, J. Baek, W. Jeong, J. Jin, J. Yoon, and **S. J. Hwang**
International Conference on Machine Learning **(ICML), 2023**, Honolulu, HI

[c102] **Margin-based Neural Network Watermarking**, B. Kim, S. Lee, S. Lee, S. Son, and **S. J. Hwang**
International Conference on Machine Learning **(ICML), 2023**, Honolulu, HI

[c101] **Continual Learners are Incremental Model Generalizers**, J. Yoon, **S. J. Hwang**, and Y. Cao
International Conference on Machine Learning **(ICML), 2023**, Honolulu, HI

[c100] **DAPPER: Label-Free Performance Estimation after Personalization for Heterogeneous Mobile Sensing**, T. Gong, Y. Kim, A. Orzikulova, Y. Liu, and **S. J. Hwang**
UbiComp (IMWUT) 2023, Cancun, Mexico

[c99] **The Devil is in the Points: Weakly Semi-Supervised Instance Segmentation via Point-Guided Mask Representation**, B. Kim, J. Jeong, D. Han, and **S. J. Hwang**
IEEE Conference on Computer Vision and Pattern Recognition **(CVPR) 2023**, Vancouver, Canada

[c98] **Any-speaker Adaptive Text-To-Speech Synthesis with Diffusion Models**, M. Kang, D. Min, and **S. J. Hwang**
(ICASSP) 2023, Rhodes Island, Greece

[c97] **Realistic Conversational Question Answering with Answer Selection based on Calibrated Confidence and Uncertainty Measurement**, S. Jeong, J. Baek, **S. J. Hwang**, and J. C. Park
(EACL) 2023, Dubrovnik, Croatia

[c96] **Meta-prediction Model for Distillation-Aware NAS on Unseen Datasets**, H. Lee, S. An, M. Kim, and **S. J. Hwang**
(ICLR) 2023, Kigali, Rwanda
(spotlight presentation)

[c95] **Self-Distillation for Further Pre-training of Transformers**, S. Lee, M. Kang, J. Lee, **S. J. Hwang** and K. Kawaguchi
International Conference on Learning Representations **(ICLR) 2023**, Kigali, Rwanda

[c94] **Sparse Token Transformers with Attention Back Tracking**, H. Lee, M. Kang, Y. Lee and **S. J. Hwang**
International Conference on Learning Representations **(ICLR) 2023**, Kigali, Rwanda

[c93] **Self-Supervised Set Representation Learning for Unsupervised Meta-Learning**, D. B. Lee, S. Lee, K. Kawaguchi, Y. Kim, J. Bang, J.-W. Ha and **S. J. Hwang**
International Conference on Learning Representations **(ICLR) 2023**, Kigali, Rwanda

[c92] **Exploring the Role of Mean Teacher in Self-supervised Masked Auto-Encoders**, Y. Lee, J. R. Willette, J. Kim, J. Lee and **S. J. Hwang**
International Conference on Learning Representations **(ICLR) 2023**, Kigali, Rwanda

[c91] **On the Soft-Subnetwork for Few-Shot Class Incremental Learning**, H. Kang, J. Yoon, S. Rizky, H. Madjid, **S. J. Hwang** and C. D. Yoo
International Conference on Learning Representations **(ICLR) 2023**, Kigali, Rwanda

[c90] **Rethinking the Entropy of Instance in Adversarial Training**, M. Kim, J. Tack, J. Shin, and **S. J. Hwang**
Workshop on Security and Trust in Machine Learning **(SaTML) 2023**, Toronto, Canada

[c89] **Graph Self-supervised Learning with Accurate Discrepancy Learning**, D. Kim, J. Baek and **S. J. Hwang**
Conference on Neural Information Processing Systems **(NeurIPS) 2022**, New Orleans, LA

[c88] **Set-based Meta-Interpolation for Few-Task Meta-Learning**, S. Lee, B. Andries, K. Kawaguchi, J. Lee and **S. J. Hwang**
Conference on Neural Information Processing Systems **(NeurIPS) 2022**, New Orleans, LA

[c87] **Factorized-FL: Personalized Federated Learning with Parameter Factorization & Similarity Matching**, W. Jeong and **S. J. Hwang**
Conference on Neural Information Processing Systems **(NeurIPS, 2022)**, New Orleans, LA

[c86] **Learning to Generate Inversion-Resistant Model Explanations**, H. Jeong, S. Lee, **S. J. Hwang** and S. Son

Conference on Neural Information Processing Systems **(NeurIPS)** 2022, New Orleans, LA

[c85] **Score-based Generative Modeling of Graphs via the System of Stochastic Differential Equations**, J. Jo, S. Lee and **S. J. Hwang**
International Conference on Machine Learning **(ICML) 2022**, Baltimore, MD

[c84] **Bitwidth Heterogeneous Federated Learning with Progressive Weight Dequantization**, J. Yoon, G. Park, W. Jeong and **S. J. Hwang**
International Conference on Machine Learning **(ICML) 2022**, Baltimore, MD

[c83] **Set Based Stochastic Subsampling**, B. Andries, S. Lee, A. T. Nguyen, J. Lee, E. Yang and **S. J. Hwang**
International Conference on Machine Learning **(ICML) 2022**, Baltimore, MD

[c82] **Forgetting-free Continual Learning with Winning Subnetworks**, H. Kang, R. J. L. Mina, S. R. H. Madjid, J. Yoon, C. D. Yoo, **S. J. Hwang** and M. Hasegawa-Johnson
International Conference on Machine Learning **(ICML) 2022**, Baltimore, MD

[c81] **KALA: Knowledge-Augmented Language Model Adaptation**, M. Kang, J. Baek, and **S. J. Hwang**
Conference of the North American Chapter of the Association for Computational Linguistics **(NAACL) 2022**, Virtual
(oral presentation)

[c80] **MPViT : Multi-Path Vision Transformer for Dense Prediction**, Y. Lee, J. Kim, J. Willette, and **S. J. Hwang**
Conference on Computer Vision and Pattern Recognition **(CVPR) 2022**, New Orleans, USA

[c79] **Augmenting Document Representations for Dense Retrieval with Interpolation and Perturbation**, S. Jeong, J. Baek, S. Cho, **S. J. Hwang**, and J. C. Park
Association for Computational Linguistics **(ACL) 2022**, Dublin, Ireland
(short paper)

[c78] **Rethinking the Representational Continuity: Towards Unsupervised Continual Learning**, D. Madaan, J. Yoon, Y. Li, Y. Liu, and **S. J. Hwang**
International Conference on Learning Representations **(ICLR), 2022**, Virtual
(oral presentation)

[c77] **Online Hyperparameter Meta-Learning with Hypergradient Distillation**, H. B. Lee, H. Lee, J. Shin, E. Yang, T. Hospedales, and **S. J. Hwang**
International Conference on Learning Representations **(ICLR) 2022**, Virtual
(spotlight)

[c76] **Model-augmented Prioritized Experience Replay**, Y. Oh, J. Shin, E. Yang, and **S. J. Hwang**
International Conference on Learning Representations **(ICLR) 2022**, Virtual

[c75] **Online Coreset Selection for Rehearsal-based Continual Learning**, J. Yoon, D. Madaan, E. Yang, and **S. J. Hwang**
International Conference on Learning Representations **(ICLR) 2022**, Virtual

[c74] **Meta Learning Low Rank Covariance Factors for Energy Based Deterministic Uncertainty**, J. Willette, H. B. Lee, J. Lee, and **S. J. Hwang**
International Conference on Learning Representations **(ICLR) 2022**, Virtual

[c73] **Sequential Reptile: Inter-Task Gradient Alignment for Multilingual Learning**, S. Lee, H. B. Lee, J. Lee, and **S. J. Hwang**
International Conference on Learning Representations **(ICLR) 2022**, Virtual

[c72] **Skill-based Meta-Reinforcement Learning**, T. Nam, S. H. Sun, K. Pertsch, **S. J. Hwang**, and J. J. Lim
International Conference on Learning Representations **(ICLR) 2022**, Virtual

[c71] **Consistency Regularization for Adversarial Robustness**, J. Tack, S. Yu, J. Jeong, M. Kim, **S. J. Hwang** and J. Shin
AAAI Conference on Artificial Intelligence **(AAAI) 2022**, Virtual
(acceptance rate = 14.96%)

[c70] **Saliency Grafting: Innocuous Attribution-Guided Mixup with Calibrated Label Mixing**, J. Park, J. Y. Yang, J. Shin, **S. J. Hwang** and E. Yang
AAAI Conference on Artificial Intelligence **(AAAI) 2022**, Virtual
(acceptance rate = 14.96%)

[c69] **Task-Adaptive Neural Network Search with Meta-Contrastive Learning**, W. Jeong, H. Lee, G. Park, E. Hyung, J. Baek and **S. J. Hwang**
Conference on Neural Information Processing System **(NeurIPS) 2021**, Virtual
(spotlight presentation) (acceptance rate <3.0%)

[c68] **Hardware-adaptive Efficient Latency Prediction for NAS via Meta-Learning**, H. Lee, S. Lee, S. Chong and **S. J. Hwang**
Conference on Neural Information Processing System **(NeurIPS) 2021**, Virtual
(spotlight presentation) (acceptance rate <3.0%)

[c67] **Mini-Batch Consistent Slot Set Encoder for Scalable Set Encoding**, A. Bruno, J. R. Willette, J. Lee and **S. J. Hwang**
Conference on Neural Information Processing System **(NeurIPS) 2021**, Virtual
(acceptance rate = 25.7%)

[c66] **Edge Representation Learning with Hypergraphs**, J. Jo, J. Baek, S. Lee, D. Kim, M. Kang and **S. J. Hwang**
Conference on Neural Information Processing System **(NeurIPS) 2021**, Virtual
(acceptance rate = 25.7%)

[c65] **Hit and Lead Discovery with Explorative RL and Fragment-based Molecule Generation**,
S. Yang D. Hwang, S. Lee. S. Ryu and **S. J. Hwang**
Conference on Neural Information Processing System **(NeurIPS) 2021**, Virtual
(acceptance rate = 25.7%)

[c64] **Cluster-Promoting Quantization with Bit-Drop for Minimizing Network Quantization Loss**,
J. H. Lee, **S. J. Hwang** and E. Yang
International Conference on Computer Vision **(ICCV) 2021**, Virtual
(acceptance rate = 25.9%)

[c63] **Multi-domain Knowledge Distillation via Uncertainty-Matching for End-to-End ASR Models**,
H. G. Kim, M. J. Lee, H. Lee, T. G. Kang, J. Lee, E. Yang and **S. J. Hwang**
International Conference on Machine Learning **(Interspeech) 2021**, Brno, Czech

Republic
(acceptance rate = 48.4%)

[c62] **Federated Continual Learning with Weighted Inter-client Transfer**, J. Yoon, W. Jeong, G. Lee and **S. J. Hwang**
International Conference on Machine Learning **(ICML) 2021**, Virtual
(acceptance rate = 21.5%)

[c61] **Learning to Generate Noise for Multi-Attack Robustness**, D. Maadan, J. Shin and **S. J. Hwang**
International Conference on Machine Learning **(ICML) 2021**, Virtual
(acceptance rate = 21.5%)

[c60] **Meta-StyleSpeech : Multi-Style Adaptive Text-to-Speech Generation**, D. Min, D. B. Lee, E. Yang and **S. J. Hwang**
International Conference on Machine Learning **(ICML) 2021**, Virtual
(acceptance rate = 21.5%)

[c59] **Large-Scale Meta-Learning with Continual Trajectory Shifting**, J. Shin, H. B. Lee, B. Gong and **S. J. Hwang**
International Conference on Machine Learning **(ICML) 2021**, Virtual
(acceptance rate = 21.5%)

[c58] **Adversarial Purification with Score-based Generative Models**, J. Yoon, **S. J. Hwang** and J. Lee
International Conference on Machine Learning **(ICML) 2021**, Virtual
(acceptance rate = 21.5%)

[c57] **Learning to Perturb Word Embeddings for Out-of-distribution QA**, S. Lee, M. Kang, J. Lee and **S. J. Hwang**,
Conference for Association for Computational Linguistics **(ACL), 2020**, Virtual
(long paper) (acceptance rate = 21.3%)

[c56] **RetCL: A Selection-based Approach for Retrosynthesis via Contrastive Learning**, H. Lee, S. Ahn, S. W. Seo, Y. Y. Song, E. Yang, **S. J. Hwang** and Jinwoo Shin, International Joint Conference on Artificial Intelligence, **(IJCAI), 2021**, Virtual
(acceptance rate = 13.9%)

[c55] **Meta-GMVAE: Mixture of Gaussian VAE for Unsupervised Meta-Learning**, D. B. Lee, D. Min, S. Lee and **S. J. Hwang**,
International Conference on Learning Representation **(ICLR), 2021**, Virtual
(spotlight presentation) (acceptance rate = 3.8%)

[c54] **Accurate Learning of Graph Representations with Graph Multiset Pooling**, J. Baek, M. Kang, and **S. J. Hwang**,
International Conference on Learning Representation **(ICLR), 2021**, Virtual
(acceptance rate = 28.7%)

[c53] **Rapid Neural Architecture Search by Learning to Generate Graphs from Datasets**, H. Lee, E. Hyung and **S. J. Hwang**,
International Conference on Learning Representation **(ICLR), 2021**, Virtual
(acceptance rate = 28.7%)

[c52] **Contrastive Learning with Adversarial Perturbations for Conditional Text Generation**, S. Lee, D. B. Lee and **S. J. Hwang**,
International Conference on Learning Representation **(ICLR), 2021**, Virtual
(acceptance rate = 28.7%)

[c51] **Federated Semi-Supervised Learning with Inter-Client Consistency & Disjoint Learning**, W. Jeong, J. Yoon, E. Yang and **S. J. Hwang**,
International Conference on Learning Representation **(ICLR), 2021**, Virtual
(acceptance rate = 28.7%)

[c50] **Learning to Sample with Local and Global Contexts from Experience Replay Buffers**, Y. Oh, K. Lee, J. Shin, E. Yang, and **S. J. Hwang**,
International Conference on Learning Representation **(ICLR), 2021**, Virtual
(acceptance rate = 28.7%)

[c49] **FedMix: Approximation of Mixup under Mean Augmented Federated Learning**, T. Yoon, H. Jeong, E. Yang and **S. J. Hwang**,
International Conference on Learning Representation **(ICLR), 2021**, Virtual
(acceptance rate = 28.7%)

[c48] **Clinical Risk Prediction with Temporal Probabilistic Asymmetric Multi-Task Learning**, T. Nguyen, H. Jeong, E. Yang and **S. J. Hwang**,
AAAI Conference on Artificial Intelligence **(AAAI), 2021**, Virtual
(acceptance rate = 21.4%)

[c47] **GTA: Graph Truncated Attention for Retrosynthesis**,
S. Seo, Y. Y. Song, J. Y. Yang, S. Bae, H. Lee, J. Shin, **S. J. Hwang** and E. Yang,
AAAI Conference on Artificial Intelligence **(AAAI), 2021**, Virtual
(acceptance rate = 21.4%)

[c46] **MetaPerturb: Transferable Regularizer for Heterogeneous Tasks and Architectures**, J. U. Ryu, J. Shin, H. B. Lee and **S. J. Hwang**,
Conference on Neural Information Processing System **(NeurIPS) 2020**, Virtual
(spotlight presentation) (acceptance rate = 4.1%)

[c45] **Learning to Extrapolate Knowledge: Transductive Few-shot Out-of-Graph Link Prediction**, J. Baek, D. B. Lee and **S. J. Hwang**,
Conference on Neural Information Processing System **(NeurIPS) 2020**, Virtual
(acceptance rate = 20.1%)

[c44] **Adversarial Self-Supervised Contrastive Learning**,
M. Kim, J. Tack and **S. J. Hwang**,
Conference on Neural Information Processing System **(NeurIPS) 2020**, Virtual
(acceptance rate = 20.1%)

[c43] **Time-Reversal Symmetric ODE Network**,
I. Huh, E. Yang, **S. J. Hwang** and J. Shin,
Conference on Neural Information Processing System **(NeurIPS) 2020**, Virtual
(acceptance rate = 20.1%)

[c42] **Bootstrapping Neural Processes**,
J. Lee, Y. Lee, J. Kim, E. Yang, **S. J. Hwang** and Y. W. Teh,
Conference on Neural Information Processing System **(NeurIPS) 2020**, Virtual
(acceptance rate = 20.1%)

[c41] **Few-shot Visual Reasoning with Meta-Analogical Contrastive Learning**,
Y. Kim, J. Shin, E. Yang and **S. J. Hwang**,
Conference on Neural Information Processing System **(NeurIPS) 2020**, Virtual
(acceptance rate = 20.1%)

[c40] **Neural Complexity Measures**,
Y. Lee, J. Lee, **S. J. Hwang**, E. Yang and S. Choi, Conference on Neural Information Processing System **(NeurIPS) 2020**, Virtual
(acceptance rate = 20.1%)

[c39] **Attribution Preservation in Network Compression for Reliable Network Interpretation**, G. Park, J. Y. Yang, **S. J. Hwang** and E. Yang,
Conference on Neural Information Processing System **(NeurIPS) 2020**, Virtual
(acceptance rate = 20.1%)

[c38] **Distribution Aligning Refinery of Pseudo-label for Imbalanced Semi-supervised Learning**, J. Kim, Y. Hur, S. Park, E. Yang, **S. J. Hwang** and J. Shin,
Conference on Neural Information Processing System **(NeurIPS) 2020**, Virtual
(acceptance rate = 20.1%)

[c37] **Neural Mask Generator: Learning to Generate Adaptive Word Maskings for Language Model Adaptation**, M. Kang, M. Han and **S. J. Hwang**,
Conference on Empirical Methods in Natural Language Processing **(EMNLP) 2020**, Virtual **(long paper) (acceptance rate = 22.4%)**

[c36] **Meta-Learning for Short Utterance Speaker Recognition with Imbalance Length Pairs**, S. M. Kye, Y. Jung, H. B. Lee, **S. J. Hwang** and Hoirin Kim,
Conference of the International Speech Communication Association **(InterSpeech) 2020**, Virtual **(acceptance rate = 47%)**

[c35] **Adversarial Neural Pruning with Latent Vulnerability Suppression**,
D. Madaan, J. Shin and **S. J. Hwang**,
International Conference on Machine Learning **(ICML) 2020**, Virtual
(acceptance rate = 21.8%)

[c34] **Cost-effective Interactive Attention Learning with Neural Attention Processes**, J. Heo, J. Park, H. Jeong, K. J. Kim, J. Lee, E. Yang, and **S. J. Hwang**,
International Conference on Machine Learning **(ICML) 2020**, Virtual
(acceptance rate = 21.8%)

[c33] **Meta Variance Transfer: Learning to Augment from the Others**, S. J. Park, S. Han, J. Baek, I. Kim, J. Song, H. B. Lee, J. Han and **S. J. Hwang**,
International Conference on Machine Learning **(ICML) 2020**, Virtual
(acceptance rate = 21.8%)

[c32] **Self-supervised Label Augmentation via Input Transformations**,
H. Lee, **S. J. Hwang** and J. Shin,
In Proceedings of the International Conference on Machine Learning **(ICML) 2020**, Virtual **(acceptance rate = 21.8%)**

[c31] **Generating Diverse and Consistent QA pairs from Contexts with Information-Maximizing Hierarchical Conditional VAEs**,
D. B. Lee, S. Lee, W. T. Jeong, D. Kim, and **S. J. Hwang**,
Conference for Association for Computational Linguistics **(ACL), 2020**, Virtual
(long paper) (acceptance rate = 25.2%)

[c30] **Segmenting 2K-Videos at 36.5 FPS with 24.3 GFLOPs: Accurate and Lightweight Realtime Semantic Segmentation Networks**,
D. Oh, D. Ji, C. Jang, Y. Hyun, H. S. Bae, **S. J. Hwang**,
International Conference on Robotics and Automation **(ICRA) 2020**, Virtual
(acceptance rate = 42%)

[c29] **Learning to Balance: Bayesian Meta-Learning for Imbalanced and Out-of-distribution Tasks**,
H. B. Lee, H. Lee, D. Na, S. Kim, M. Park, E. Yang and **S. J. Hwang**,
International Conference on Learning **(ICLR) 2020**, Virtual
(oral presentation) (acceptance rate = 1.9%)

[c28] **Meta Dropout: Learning to Perturb Latent Features for Generalization**, H. B. Lee, T. Nam, E. Yang and **S. J. Hwang**, International Conference on Learning **(ICLR) 2020**, Virtual **(acceptance rate = 26.5%)**

[c27] **Scalable and Order-robust Continual Learning with Additive Parameter Decomposition**, J. Yoon, S. Kim, E. Yang and **S. J. Hwang**, International Conference on Learning **(ICLR) 2020**, Virtual **(acceptance rate = 26.5%)**

[c26] **Why Not to Use Zero Imputation? Correcting Sparsity Bias in Training Neural Networks**, J. Yi, J. Lee, **S. J. Hwang** and E. Yang, International Conference on Learning **(ICLR) 2020**, Virtual **(acceptance rate = 26.5%)**

[c25] **Deep Mixed Effect Model using Gaussian Processes: A Personalized and Reliable Prediction for Healthcare**, I. Chung, S. Kim. J. Lee, **S. J. Hwang** and E. Yang, AAAI Conference on Artificial Intelligence **(AAAI) 2020**, New York, USA **(acceptance rate = 20.6%)**

[c24] **Episodic Memory Reader: Learning What to Remember for Question Answering from Streaming Data**, M. Han, M. Kang, H. Jung, S. J. Hwang, Conference for Association for Computational Linguistics **(ACL) 2019**, Florence, Italy. **(long paper, oral presentation) (acceptance rate = 22.7%)**

[c23] **Learning What and Where to Transfer** Y. Jang, H. Lee, **S. J. Hwang** and J. Shin, International Conference on Machine Learning **(ICML) 2019**, Long Beach, USA. **(acceptance rate = 22.6%)**

[c22] **Learning to Quantize Deep Networks by Optimizing Quantization Intervals with Task Loss**, S. Jung, C. Son, S. Lee, J. Son, J. J. Han, Y, Kwak, **S. J. Hwang**, and C. Choi, IEEE Conference on Computer Vision and Pattern Recognition **(CVPR) 2019**, Long Beach, USA. **(oral presentation) (acceptance rate = 5.6%)**

[c21] **Learning to Propagate Labels: Transductive Propagation Networks for Few-shot Learning**, Y. Liu, J. Lee, M. Park, S. Kim, E. Yang, **S. J. Hwang**, and Y. Yang, International Conference on Learning Representations **(ICLR) 2019**, New Orleans, USA. **(acceptance rate = 31.4%)**

[c20] **Dropmax: Adaptive Variational Softmax**, H. Lee, J. Lee, S. Kim, E. Yang and **S. J. Hwang**, Conference on Neural Information Processing System **(NeurIPS) 2018**, Montreal, Canada. **(acceptance rate = 20.8%)**

[c19] **Uncertainty-Aware Attention for Reliable Interpretation and Prediction**, J. Heo, H. Lee, S. Kim, J. Lee, K. Kim, E. Yang and **S. J. Hwang**, Conference on Neural Information Processing System **(NeurIPS) 2018**, Montreal, Canada. **(acceptance rate = 20.8%)**

[c18] **Joint Active Feature Acquisition and Classification with Variable-Size Set Encoding**, H. Shim, **S. J. Hwang**, and E. Yang, Conference on Neural Information Processing System **(NeurIPS) 2018**, Montreal, Canada. **(acceptance rate = 20.8%)**

[c17] **Deep Asymmetric Multitask Feature Learning**,
H. Lee, E. Yang and **S. J. Hwang**,
International Conference on Machine Learning **(ICML) 2018**, Stockholm, Sweden.
(acceptance rate = 25.0%)

[c16] **Lifelong Learning with Dynamically Expandable Networks**,
J. Yoon, E. Yang, J. Lee and **S. J. Hwang**,
International Conference on Learning Representations **(ICLR) 2018**, Vancouver, Canada. **(acceptance rate = 33.7%)**

[c15] **SplitNet: Learning to Semantically Split Deep Networks for Parameter Reduction and Model Parallelization**,
J. Kim, Y. Park, G. Kim and **S. J. Hwang**,
International Conference on Machine Learning **(ICML) 2017**, Sydney, Australia.
(acceptane rate = 25.5%)

[c14] **Combined Group and Exclusive Sparsity for Deep Neural Networks**,
J. Yoon and **S. J. Hwang**,
International Conference on Machine Learning **(ICML) 2017**, Sydney, Australia.
(acceptance rate = 25.5%)

[c13] **Taxonomy-Regularized Semantic Deep Convolutional Neural Networks**,
W. Goo, J. Kim, G. Kim and **S. J. Hwang**,
European Conference on Computer Vision **(ECCV) 2016**, Amsterdam, Netherland.
(acceptance rate = 26.6%)

[c12] **Asymmetric Multi-task Learning Based on Task Relatedness and Loss**,
G. Lee, E. Yang, and **S. J. Hwang**,
International Conference on Machine Learning **(ICML) 2016**, New York City, NY.
(acceptance rate = 24%)

[c11] **Knowledge Transfer with Interactive Learning of Semantic Relationships**, J. Choi, **S. J. Hwang**, L. Sigal, and L. S. Davis,
AAAI Conference on Artificial Intelligence **(AAAI) 2016**, Phoenix.
(oral presentation) (acceptance rate = 26%)

[c10] **Exploiting View-Specific Appearance Similarities Across Classes for Zero-shot Pose Prediction: A Metric Learning Approach**,
A. Kuznetsova, **S. J. Hwang**, B. Rosenhahn, and L. Sigal,
AAAI Conference on Artificial Intelligence **(AAAI) 2016**, Phoenix, AZ.
(acceptance rate = 26%)

[c9] **Expanding Object Detector's Horizon: Incremental Learning Framework for Object Detection in Video**,
A. Kuznetsova, **S. J. Hwang**, B. Rosenhahn, and L. Sigal,
IEEE Conference on Computer Vision and Pattern Recognition **(CVPR) 2015**, Boston, MA. **(acceptance rate = 25%)**

[c8] **A Unified Semantic Embedding: Relating Taxonomies with Attributes**, **S. J. Hwang** and L. Sigal,
Conference on Neural Information Processing System **(NeurIPS) 2014**, Montreal, Canada. **(acceptance rate = 25%)**

[c7] **Analogy-preserving Semantic Embedding for Visual Object Categorization**, **S. J. Hwang**, K. Grauman, and F. Sha,
International Conference on Machine Learning **(ICML) 2013**, Atlanta, GA. **(acceptance rate = 24%)**

[c6] **Semantic Kernel Forests from Multiple Taxonomies**,
S. J. Hwang, K. Grauman, and F. Sha,
Conference on Neural Information Processing System **(NeurIPS) 2012**, Lake Tahoe, NV. **(acceptance rate = 25%)**

[c5] **Context-Based Automatic Local Image Enhancement**,
S. J. Hwang, A. Kapoor, and S. B. Kang,
European Conference on Computer Vision **(ECCV) 2012**, Firenze, Italy
(acceptance rate = 25%)

[c4] **Learning a Tree of Metrics with Disjoint Visual Features**,
S. J. Hwang, K. Grauman, and F. Sha,
Conference on Neural Information Processing System **(NeurIPS) 2011**, Granada, Spain. **(acceptance rate = 22%)**

[c3] **Sharing Features Between Objects and Their Attributes**,
S. J. Hwang, F. Sha and K. Grauman,
IEEE Conference on Computer Vision and Pattern Recognition **(CVPR) 2011**, Colorado Springs, CO. **(acceptance rate = 22.5%)**

[c2] **Accounting for the Relative Importance of Objects in Image Retrieval**,
S. J. Hwang and K. Grauman,
British Machine Vision Conference **(BMVC) 2011**, Aberystwyth, UK.
(oral presentation) (acceptance rate = 8.4%)

[c1] **Reading Between the Lines: Object Localization Using Implicit Cues from Image Tags**, **S. J. Hwang** and K. Grauman,
IEEE Conference on Computer Vision and Pattern Recognition **(CVPR) 2010**, San Francisco, CA. **(oral presentation) (acceptance rate = 4.5%)**

Workshop Publications

[w11] **Federated Semi-Supervised Learning with Inter-Client Consistency**, W. Jeong, J. Yoon, E. Yang, and **S. J. Hwang**,
ICML Workshop in Federated Learning, 2020, Online,
(long presentation) (best student paper award)

[w10] **Federated Continual Learning with Weighted Inter-Client Transfer**, J. Yoon, W. Jeong, G. Lee, E Yang, and **S. J. Hwang**,
ICML Workshop in Lifelong Learning, 2020, Online

[w9] **Adversarial Neural Pruning**, D. Maadan and **S. J. Hwang**,
NeurIPS Workshop on Safety and Robustness in Decision Making, 2019, Vancouver, CA

[w8] **Uncertainty-Aware Deep Temporal Asymmetric Multi-task Learning**, H. Jeong, T. A. Nguyen, E. Yang and **S. J. Hwang**,
Women in Machine Learning Workshop, NeurIPS 2019, Vancouver, CA

[w7] **Cost-Effective Interactive Attention Learning for Action Recognition**, J. Heo, J. Park, H. Jeong, W. Shin, K. J. Kim, and **S. J. Hwang**,
ICCV Workshop on Interpreting and Explaining Visual Artificial Intelligence Models, 2019, Seoul, Korea

[w6]**A Metric Learning Approach for Multi-View Object Recognition and Zero-shot Pose Estimation**,
A. Kuznetsova, **S. J. Hwang**, B. Rosenhahn and L. Sigal,
ICCV Workshop on Object Understanding for Interaction, ICCV 2015, Santiago, Chile, Dec 2015.

[w5] **Interactive Semantics for Knowledge Transfer**,
J. Choi, **S. J. Hwang**, L. Sigal and L. S. Davis,
ICML Active Learning Workshop, 2015, Lillle, France, July 2015.

[w4] **A Unified Semantic Embedding: Relating Taxonomies and Attributes**,
S. J. Hwang and L. Sigal and L. S. Davis,
AAAI Spring Symposium on Knowledge Representation and Reasoning **(KRR), 2015**, Stanford, CA.

[w3] **A Unified Semantic Embedding: Relating Taxonomies and Attributes**,
S. J. Hwang and L. Sigal and L. S. Davis,
NIPS Workshop on Learning Semantics, NIPS 2014, Montreal, Canada.

[w2] **Semantic Kernel Forests from Multiple Taxonomies**,
S. J. Hwang, F. Sha, and K. Grauman,
International Workshop on Large Scale Visual Recognition and Retrieval **(BigVision), NIPS, 2012**, Lake Tahoe, NV, Dec 2012. **(oral presentation)**

[w1] **Sharing Features Between Visual Tasks at Different Levels of Granularity**, **S. J. Hwang**, F. Sha, and K. Grauman,
Fine-Grained Visual Categorization Workshop **(FGVC), CVPR 2011**, Colorado Springs, CO.

PREPRINTS

[i10] **Model-Augmented Q-Learning**,
Y. Oh, J. Shin, E. Yang, and **S. J. Hwang**,
arXiv:2102.03866, Feb 2021.

[i9] **Large-Scale Meta-Learning with Continual Trajectory Shifting**,
J. Shin, H. B. Lee, B. Gong, and **S. J. Hwang**,
arXiv:2102.07215, Feb 2021.

[i8] **Improving Uncertainty Calibration via Prior Augmented Data**,
J. Willette, J. Lee, and **S. J. Hwang**,
arXiv:2102.10803, Feb 2021.

[i7] **Semi-Relaxed Quantization with DropBits: Training Low-Bit Neural Networks via Bit-wise Regularization**,
J. Lee, J. Yun. **S. J. Hwang**, and E. Yang
arXiv:1911.12990, Nov 2019

[i6] **Learning to Disentangle Robust and Vulnerable Features for Adversarial Detection**, B. Joe, **S. J. Hwang** and I. Shin,
arXiv:1909.04311, Sep 2019

[i5] **H. Lee, D. Na, H. Lee and S. J. Hwang, Learning to Generalize to Unseen Tasks with Bilevel Optimization**,
arXiv:1908.01457, Aug 2019

[i4] **Reliable Estimation of Individual Treatment Effect with Causal Information Bottleneck** S. Kim, Y. Baek, **S. J. Hwang** and E. Yang,
arXiv:1906.03118, Jun 2019

[i3] **Adaptive Network Sparsification with Dependent Beta-Bernoulli Dropout**,
J. Lee, S. Kim, J. Yoon, H. Lee, E. Yang, and **S. J. Hwang**,
arXiv:1805.10896, May 2018

[i2] **Learning to Separate Domains in Generalized Zero-Shot and Open Set Learning: a Probabilistic Perspective**, H. Dong, Y. Fu, Y. Jiang, W. Liu, **S. J. Hwang**, L. Sigal, and X. Xue,
arXiv:1810.07368, May 2018

[i1] **Hierarchical Maximum-Margin Clustering**, G. Zhou, **S. J. Hwang**, M. Schmidt, L. Sigal and G. Mori,
arXiv:1502.01827, Feb 2015

Patents

[**p3**] **Incremental Learning Framework for Object Detection in Videos**,
A. Kuznetsova, **S. J. Hwang** and L. Sigal,
US Patent 9,805,264, Oct 2017

[**p2**] **Incremental Category Embedding for Categorization**,
S. J. Hwang and L. Sigal,
US 9317782 B2, Apr 2016

[**p1**] **Object Classification Through Semantic Mapping**,
S. J. Hwang, J. Choi and L. Sigal,
US 20160292538 A1, Mar 2015

Reviewer Services

Program Committee

- 2015, 2016, 2017, 2018, 2019 International Conference on Machine Learning **(ICML)**
- 2016, 2017, 2019 AAAI Conference on Artificial Intelligence **(AAAI)**
- 2016, 2018, 2019 International Joint Conference on Artificial Intelligence **(IJCAI)**

Reviewer

- 2012, 2013, 2014, 2017, 2018, 2019, 2020 Neural Information Processing System (NeurIPS, NIPS), Top 10% Reviewer (NeurIPS 2020)
- 2013, 2014, 2015, 2019, 2020 IEEE Conference on Computer Vision and Pattern Recognition (CVPR)
- 2013, 2017, 2019 International Conference on Computer Vision (ICCV)
- 2012, 2014, 2020 European Conference on Computer Vision (ECCV)
- 2019, 2020, 2021 Annual Meeting of the Association for Computational Linguistics (ACL)
- 2020 Conference on Empirical Methods in Natural Language Processing (EMNLP)
- 2017, 2020 International Conference on Artificial Intelligence and Statistics (AISTATS)
- 2012, 2014, 2018 Asian Conference on Computer Vision (ACCV)
- 2012, 2013 IEEE Transaction on Multimedia
- 2014 ACM SIGGRAPH
- 2014 ACM SIGGRAPH Asia
- 2014 CVPR Workshop on Egocentric Vision (EgoVision)
- 2014 ECCV Workshop on Storytelling with Images and Videos (VisStory)
- 2016 Eurographics (EG)

Awards

- Engineering School Technology Innovation Award, KAIST, 2020
- Best Student Paper Award, International Workshop on Federated Learning for User Privacy and Data Confidentiality, 2020
- Google AI Focused Research Award, Google, 2018
- Dean's Excellence Award from the College of Natural Sciences, University of Texas at Austin, 2010

GRANTS

Have secured **₩8.48B** (**$7.53M** USD) research funding in total.

- Deep Learning Based AI Learning and Inference Technology for Drones (4/2020-12/2023) **₩280M**, ETRI
- Deep Knowledge Infence from Large-Scale Text (11/2019-10/2020) **₩200M**, Samsung Electronics
- Penetration Security Testing of ML Model Vulnerabilities and Defense (co-PI) (4/2020-12/2027) **₩1.35B**, Institute for Information & Communication Technology Planning & Evaluation
- Center for Applied Research in AI (co-PI) (12/2019-12/2022) **₩371M**, Agency for Defense Development
- Fixed-Point Adaptive Personalized Federated Learning (co-PI) (12/2020-12/2022) **₩320M**, Samsung Electronics
- Specialized Deep Learning Models for Automated Inspection Process (PI) (4/2020-12/2020) **₩120M**, LG CNS
- Explainable AI-based Interactive Satellite Image Analysis and Deep Learning Acceleration (PI) (11/2019-10/2022) **₩300M**, SI
- Human-Inspired Large Scale Visual Recognition System (12/2015-02/2020) (PI), **₩1.1B**, Samsung Research Funding Center of Samsung Electronics
- Improving Generalization and Reliability of Any Deep Neural Networks (10/2018-10/2021) (PI) **$150K**, Google
- Exploiting Temporal Locality in CNN-RNN Architectures (09/2018-06/2020), **₩200M**, Samsung Electronics
- Affective Conversational Agents (5/2017-4/2018) (PI), **₩200M**, Naver
- Deep Learning-Based Survivor Detection System for Unmanned Aerial Vehicles (09/2016-05/2018) (PI), **₩260M**, National Research Foundation
- Semantic-Based Interactive Learning System for Visual Recognition (11/2015-10/2018) (PI), **₩150M**, National Research Foundation
- Massive Machine Learning - KAIST MARS AI Integrated Research Center (08/2018-02/2024) (co-PI), **₩125M per year**, National Research Foundation
- Efficient Large-Scale Deep Learning – Neural Research Processing Center (11/2017-10/2020) (Co-PI), **₩150M per year**, Samsung Electronics
- Explainable Artificial Intelligence – Next Generation Artificial Intelligence (08/2017 07/2021) (Co-PI), **₩200M per year**, Institution for Information & Communications & Technology Promotion
- Adaptive Machine Learning Technology Development for Intelligent Autonomous Digital Companion (01/2018-08/2020) (Co-PI), **₩150M per year**, Institution for Information & Communications & Technology Promotion
- Petaflop-Scale Machine Learning Framework - Next Generation High-Performance Computing (11/2016-07/2021) (Co-PI), **₩100M per year**, National Research Foundation
- Multitask Deep Learning Models for Disease Prediction from Electronic Health Records (04/2017-09/2017) (PI), **₩70M**, AITrics
- Semantic and Contextual Dialogue Generation Using Generative Adversarial Networks (04/2017-12/2017) (PI), **₩80M**, SKT
- Incremental Learning for Object Detection, Pose Estimation, and Object Trajectory Estimation (09/2016-08/2017) (PI), **₩72.25M**, Hyundai Motor Company
- Automatic Vibration Analysis using Deep Learning (07/2016-03/2017) (PI), **₩55M**, Hyundai Motor Company
- Simultaneous Object/Scene Recognition and Learning from Driving Videos (12/2015-5/2016) (PI), **₩30M**, Hyundai NGV
- Hazard/Accident Prediction and Evasion System Leveraging Big Data (12/2015-5/2016) (PI), **₩30M**, Hyundai NGV

Invited Talks

AI for the Real-World
- Korean Artificial Intelligence Association Summer Conference, Online, 2020
- Seoul National University, Seoul, Korea, 2020
- Samsung Advanced Institute of Technology, Suwon, Korea, 2020

Low-Resource Deep Learning
- Workshop on Low-Resource Learning, Beijing, China, 2019

Learning to Balance: Bayesian Meta-Learning for Imbalanced and Out-of-distribution Tasks
- 2019 International Conference on Data Science, Shanghai, China, 2019
- AI Korea 2019, Seoul, Korea 2019

Beyond Explainable AI - Reliable AI
- Korean Society of Artificial Intelligence in Medicine, Seoul, Korea, 2019

Explainable AI vs. Unexplainable AI
- Patent Court of Korea, Daejeon, Korea, 2018

Models and Algorithms for Large-scale Deep Learning
- Naver AI Colloquium 2018, Seoul, Korea, 2018
- Samsung Electronics (DS), Suwon, Korea, 2018
- Samsung Research, Seoul, Korea, 2018
- Seoul National University, Seoul, Korea, 2018
- KAIST, Daejeon, Korea, 2018
- Postech, Pohang, Korea, 2018

Machine Learning for Healthcare
- Korean Society of AI for Law, 2018
- 2018 AI Summer School, Seoul, Korea, 2018
- Samsung Research, Seoul, Korea, 2018
- Samsung SW Center Seoul R&D Forum, Seoul, Korea, 2018
- Postech, Pohang, Korea, 2018

Real-time Sports Commentary Generation with Deep Learning
- AI Worldcup 2018, Daejeon, Korea, 2018
- AI Worldcup 2017, Daejeon, Korea, 2017

Dynamically Expandable Networks
- Pangyo Future Forum, Pangyo, Korea
- AI Korea 2018, Seoul, Korea, 2018

Advances in Deep Learning
- The AI Korea 2018, Seoul, Korea, 2018

Deep Asymmetric Multitask Feature Learning
- 2018 Korean Conference on Computer Vision, Seoul, Korea, 2018

SplitNet: Learning to Semantically Split Deep Networks for Parameter Reduction and Model Parallelization
- 2017 International Workshop on Highly Efficient Neural Network Design (HENND), Seoul, Korea, 2017

- 2017 Asian Conference on Machine Learning, AI Society Workshop, Seoul, Korea, 2017
- 2017 Korean Conference on Computer Vision, Seoul, Korea, 2017

Human-Inspired Extremely Large Scale Visual Recognition System
- Samsung Advanced Institute of Technology, Suwon, Korea, 2017
- Software Convergence Symposium 2017 (SWCS 2017), Seoul, Korea, 2017
- The 6th Winter School on Image Understanding, Gangwon, Korea, 2017
- Ulsan National Institute of Science and Technology, Ulsan, Korea, 2017

Extreme-Scale Deep Learning Framework for Petaflop-Scale Supercomputers
- Computer System Society Winter School, Gangwon, Korea, 2016

Deep Learning Methods for Object Detection on UAVs
- The 13th Short Course on UAV Technology: Guidance, Navigation, and Control, Seoul, Korea, 2016

*L*earning a Semantic Space for Recognition and Inference
- Postech, Pohang, Korea, 2016
- Chonnam National University, Gwangju, Korea, 2016

Exploiting View-Specific Appearance Similarities Across Classes for Zero-shot Pose Prediction
- 2015 Korean Conference on Computer Vision, Seoul, Korea, 2015

A Unified Semantic Embedding: Relating Taxonomies with Attributes
- 2014 Korean Conference on Computer Vision, Seoul, Korea, 2014

Discriminative Object Categorization with External Semantic Knowledge
- VASC Seminar, Carnegie Mellon University, Pittsburgh, PA, 2013
- Ulsan National Institute of Science and Technology, Ulsan, Korea, 2013
- Chonnam National University, Gwangju, Korea, 2013
- Chungbuk National University, Cheongju, Korea, 2013

Research Experience

KAIST

Assistant/Associate Professor **01/01/2018-Current**

- Conducting research on deep learning, with specific focus on generalization, efficiency, and robustness of deep neural networks, to enhance its real-world applicability to diverse application areas such as visual recognition, natural language understanding, speech recognition & synthesis, healthcare, and finance.

UNIST

Assistant Professor **08/26/2014-12/31/2017**

- Conducted research on deep learning for visual recognition, healthcare, and natural language understanding.

Disney Research

Postdoctoral Research Associate **09/16/2013-08/24/2014**

- Conducted research on feature learning and categorization model learning for large-scale and fine-grained categorization.

- Mentor: Leonid Sigal, Senior Research Scientist (Now Professor at UBC)

Microsoft Research

Research Intern **06/06/2011-09/02/2011**

- Researched and developed an automatic image enhancement system, which finds an optimal enhancement map for a given image, with coarse-to-fine search for the optimal pixelwise enhancement operators using localized hashing on the learned metrics, followed by a Gaussian process smoothing step (ECCV 2012).
- Mentors:
  Sing Bing Kang, Principal Researcher
  Ashish Kapoor, Principal Researcher

The University of Texas at Austin

Research Assistant **08/16/2009-08/16/2013**

- Performed research on solving various computer vision tasks (object detection, image retrieval, automatic image annotation, object categorization) with machine learning approaches (multi-view learning, multitask learning, metric learning, multiple kernel learning, manifold/embedding learning).

Advising Activity

Students' Degrees Completed Under My Supervision

- Ahra Jo, Ph.D., 08/2019
  (Thesis: "Visual Recognition for Autonomous Vehicles")
- Jeong Un Ryoo, M.S., 02/2021 (Thesis: "MetaPerturb: Transferable Regularizer for Heterogeneous Tasks and Architectures")
- Hyewon Jeong, M.S. 02/2021 (Thesis: "Clinical Risk Prediction with Temporal Probabilistic Asymmetric Multi-Task Learning")
- Tuan Nguyen, M.S., 08/2020 (Thesis: "Stochastic Subset Selection")
- Bruno Andries, M.S., 02/2020
  (Thesis: "Video Object Detection and Segmentation")
- Dong Hyun Na, M.S., 08/2019 (Thesis: "Learning to Balance: Bayesian Meta-Learning for Imbalanced and Out-of-distribution Tasks")
- Jay Heo, M.S., 02/2019 (Thesis: "Uncertainty-Aware Attention for Reliable Interpretation and Prediction")
- Moonsu Han, M.S., 02/2019 (Thesis: "Episodic Memory Reader: Learning What to Remember for Question Answering from Streaming Data")
- Hae Beom Lee, M.S., 02/2018
  (Thesis: "DropMax: Adaptive Variational Softmax")
- Jaehong Yoon, M.S., 02/2018
  (Thesis: "Lifelong Learning with Dynamically Expandable Networks")

Current Student Advisees

- Hae Beom Lee, Ph.D. student, 08/2018 - **02/2022 (Expected)**
- Jaehong Yoon, Ph.D. student, 08/2018 - **02/2022 (Expected)**
- Jay Heo, Ph.D. student, 02/2019 - **02/2022 (Expected)**
- Hayeon Lee, Ph.D. student, 02/2018 -
- Jinmyung Kwak, Ph.D. student, 02/2019 -
- Taewook Nam, Ph.D. student, 03/2020 -
- Minseon Kim, Ph.D. student, 03/2020 -

- Bruno Andries, Ph.D. student, 03/2020 -
- Junhyun Park, M.S. student, 08/2018 -
- Minki Kang, M.S. student, 03/2020 -
- Dongbok Lee, M.S. student, 09/2019 -
- Divyam Madaan, M.S. student, 09/2019 -
- Jeff Willette, M.S. student, 09/2019 -
- Eunyoung Hyung, M.S. student, 09/2019 -
- Jaewoong Shin, M.S. student, 09/2019 -
- Wongyong Jeong, M.S. student, 03/2020 -
- Jinheon Baek, M.S. student, 03/2020 -
- Minyoung Song, M.S. student, 03/2020 -
- Seanie Lee, M.S. student, 03/2020 -
- Dongchan Min, M.S. student, 09/2020 -
- Seul Lee, M.S. student, 09/2020 -

Teaching Experience

KAIST

Undergraduate Courses

- Special Topics in Computer Science: Deep Learning (Spring 2018)

Graduate Courses

- Advanced Deep Learning (Spring 2020, Fall 2020)
- Machine Learning for Artificial Intelligence (Fall 2019)
- Advanced Machine Learning (Spring 2019)
- Advanced Machine Learning (Fall 2018)

UNIST

Undergraduate Courses

- Introduction to Algorithm (Fall 2017)
- Special Topics in Computer Science: Deep Learning (Spring 2017)
- Theory of Computation (Fall 2016)
- Machine Learning (Spring 2016)
- Engineering Programming (Fall 2015, Fall 2014)
- Special Topics in Computer Science: Visual Recognition (Spring 2015)

Graduate Courses

- Machine Learning for Healthcare (Fall 2017)
- Advanced Machine Learning (Fall 2016)

Professional Experience

Samsung Advanced Institute of Technology (SAIT), Suwon, South Korea

Research Advisor **8/1/2018-Current**

- Led the Fundamental AI TF Team which focus on tackling fundamental machine learning problems with special focus on material development and industrial AI, along with Prof. Eunho Yang and Jinwoo Shin.
- Published seven papers to top-tier ML/AI conferences (ICML, NeurIPS, ICLR, and AAAI).

AITRICS, Seoul, South Korea

Research Advisor **12/1/2016-Current**

- Led the research on machine learning for healthcare, speech recognition/synthesis, dialogue agents, drug discovery and AutoML platform.

SK Communications (EMPAS), Seoul, South Korea

Lead Staff, System Programmer - Search Departement **07/16/2005-01/11/2007**

- Served as a system programmer for the search development team.
- Performed periodic experiments on disk and DB peformance, built search logging tools, conducted search log analysis, and reported results.

Comin Information Systems, Gwangju, South Korea

Programmer & Researcher - R&D Department **02/24/2004-07/15/2005**

- Served as a researcher and programmer for several mission-critical projects, including development of a license plate recognition parking system, medical imaging simulator, and 3D graphics engine.

References

- Kristen Grauman (grauman@utexas.edu)
- Fei Sha (feisha@usc.edu)
- Sing Bing Kang (sbkang@microsoft.com)
- Ashish Kapoor (akapoor@microsoft.com)
- Leonid Sigal (lsigal@disneyresearch.com)
- Byoung-Tak Zhang (btzhang@bi.snu.ac.kr)
- Seong-Whan Lee (sw.lee@korea.ac.kr)

Citizenship

- Republic of Korea

Date of Birth

- February 15th, 1982