Juho Lee

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1 Academic History

- July 2020 - Present: Assistant professor.
  The graduate school of AI, KAIST.
- Feb 2018 - Feb 2019: Postdoctoral Research Assistant.
  Department of Statistics, University of Oxford.
  Supervisor: François Caron.
- Mar 2011 - Feb 2018: Master of Science and Doctor of Philosophy (integrated).
  Department of Computer Science and Engineering, POSTECH.
  Supervisor: Seungjin Choi.
  Thesis: *Efficient Bayesian Nonparametric Inference: Tree-Based Methods and Power-Law Models*.
  GPA: 4.05/4.30.
- Mar 2007 - Feb 2011: Bachelor of Computer Science and Engineering.
  Department of Computer Science and Engineering, POSTECH.
  GPA: 3.99/4.30 (*Summa Cum Laude*).

2 Industrial Activities

- Sep 2017 - June 2020: Research Scientist.
  AITRICS.
  Developing deep learning technologies for interpretable medical artificial intelligence.

3 Research Interests

- Bayesian nonparametric models.
- Bayesian deep learning and deep Bayesian learning.
- Random graph models.
- Deep learning for healthcare

4 Honors

- ICML student travel award (2017).
- NIPS student travel award (2016).
- Global Ph.D fellowship (National Research Foundation of Korea, 2011-2012).
- Chung-Am graduate fellowship (POSTECH, 2011-2013).

5 Publications

5.1 Preprints

- Fadhel Ayed, **Juho Lee** and François Caron.
  The Normal-Generalised Gamma-Pareto process: a novel pure-jump Lévy process with flexible tail and jump-activity properties.
  arXiv:2006.10968.

- **Juho Lee**, Yoonho Lee and Yee Whye Teh.
  Deep amortized clustering.
  arXiv:1909.13433, 2019.

- **Juho Lee**, Saehoon Kim, Jaehong Yoon, Hae Beom Lee, Eunho Yang, and Sung Ju Hwang.
  Adaptive network sparsification via dependent variational beta-Bernoulli dropout.
  arXiv:1805.10896v2, 2018.

5.2 International Journals

- **Juho Lee**, Xenia Miscouridou, and François Caron.
  A unified construction for series representations and finite approximations of completely random measures.
  To appear in *Bernoulli*, 2022.

5.3 Workshop contributions

- **Juho Lee**, Yoonho Lee and Yee Whye Teh.
  Towards deep amortized clustering.
  NeurIPS 2019 Sets & Partitions workshop (**contributed talk**).

- Tony Duan and **Juho Lee**.
  Graph embedding VAE: a permutation invariant model of graph structure.
  NeurIPS 2019 Graph Representation Learning workshop.

5.4 International Conferences

- Seanie Lee, Bruno Andreis, Kenji Kawaguchi, **Juho Lee**, Sung Ju Hwang.
  Set-based meta-interpolation for few-task meta-learning.
  To appear in *Advances in Neural Information Processing Systems (NeurIPS), 2022*.
- Balhae Kim, Jungwon Choi, Seanie Lee, Yoonho Lee, Jung-Woo Ha, **Juho Lee**.
  On divergence measures for Bayesian pseudocoresets.
  To appear in *Advances in Neural Information Processing Systems (NeurIPS), 2022*.
- Giung Nam, Hyungi Lee, Byeongho Heo, **Juho Lee**.
  Improving ensemble distillation with weight averaging and diversifying perturbation.
  International Conference on Machine Learning (ICML), 2022.
- Bruno Andreis, Seanie Lee, A. Tuan Nguyen, **Juho Lee**, Eunho Yang, Sung Ju Hwang
  Set based stochastic subsampling.
  International Conference on Machine Learning (ICML), 2022.
- Hyungi Lee, Eunggu Yoon, Hongseok Yang, and **Juho Lee**.
  Scale mixtures of neural network Gaussian processes.
  International Conference on Learning Representations (ICLR), 2022.
- Hyungi Lee, Eunggu Yoon, Hongseok Yang, and **Juho Lee**.
  Scale mixtures of neural network Gaussian processes.
  International Conference on Learning Representations (ICLR), 2022.
- Seanie Lee, Hae Beom Lee, **Juho Lee**, and Sung Ju Hwang.
  Sequential Reptile: inter-task gradient alignment for multilingual learning.
  International Conference on Learning Representations (ICLR), 2022.
- Jeffrey Ryan Willette, Hae Beom Lee, **Juho Lee**, and Sung Ju Hwang.
  Meta learning low rank covariance factors for energy-based deterministic uncertainty. *International Conference on Learning Representations (ICLR)*, 2022.
- Giuing Nam*, Jongmin Yoon*, Yoonho Lee, and **Juho Lee**.
  Diversity matters when learning from ensembles.
  Advances in Neural Information Processing Systems (NeurIPS), 2021.
- Andreis Bruno, Jeffrey Ryan Wilette, **Juho Lee**, and Sung Ju Hwang.
  Mini-batch consistent slot set encoder for scalable set encoding.
  Advances in Neural Information Processing Systems (NeurIPS), 2021.
- Yanbin Liu, **Juho Lee**, Linchao Zhu, Ling chen, Humphrey Shi, and Yi Yang.
  A multi-mode modulator for multi-domain few-shot classification.
  International Conference on Computer Vision (ICCV), 2021.
- Jongmin Yoon, Sung Ju Hwang, and **Juho Lee**.
  Adversarial purification with score-based generative models.
  International Conference on Machine Learning (ICML), 2021.

- Seanie Lee, Minki Kang, **Juho Lee**, Sung Ju Hwang.
  Learning to perturbe word embeddings for out-of-distribution QA.
  Meeting of the Association for Computational Linguistics (ACL), 2021 (full paper).
- Jinwoo Kim*, Jaehoon Yoo*, **Juho Lee**, and Seunghoon Hong.
  SetVAE: learning hierarchical composition for generative modelling of set-structured data.
  Computer Vision and Pattern Recognition (CVPR), 2021 (*: equal contribution).
- **Juho Lee***, Yoonho Lee*, Jungtaek Kim, Sung Ju Hwang, Eunho Yang, and Yee Whye Teh.
  Bootstrapping neural processes.
  Advances in Neural Information Processing Systems (NeurIPS), 2021 (*: equal contribution).
- Yoonho Lee, **Juho Lee**, Eunho Yang, Sung Ju Hwang, and Seungjin Choi.
  Neural complexity measures.
  Advances in Neural Information Processing Systems (NeurIPS), 2021.
- Jay Heo, Junhyeon Park, Hyewon Jeong, Kwang Joon Kim, **Juho Lee**, Eunho Yang, and Sung Ju Hwang.
  Cost-effecitve interactive attention learning with neural attention processes.
  International Conference on Machine Learning (ICML), 2020.
- Ingyo Chung, Saehoon Kim, **Juho Lee**, Sung Ju Hwang, and Eunho Yang.
  Deep mixed effect model using Gaussian processes: a personalized and reliable prediction for healthcare.
  AAAI Conference on Artificial Intelligence (AAAI), 2020 (to appear).
- Fadhel Ayed*, **Juho Lee***, and Fraçois Caron.
  Beyond the Chinese restaurant and Pitman-Yor processes: statistical models with double power-law behavior.
  International Conference on Machine Learning (ICML), 2019 (*: equal contribution, **long oral**).
- **Juho Lee**, Yoonho Lee, Jungtaek Kim, Adam R. Kosiorek, Seungjin Choi, and Yee Whye Teh. Set transformer: a framework for attention-based permutation-invariant neural networks. *International Conference on Machine Learning (ICML)*, 2019.
- Yanbin Liu, **Juho Lee**, Minseop Park, Saehoon Kim, Eunho Yang, Sung Ju Hwang, and Yi Yang.
  Learning to propagate labels: transductive propagation network for few-shot learning.
  International Conference on Learning Representations (ICLR), 2019.
- **Juho Lee**, Lancelot F. James, Seungjin Choi, and François Caron.
  A Bayesian model for sparse graphs with flexible degree distribution and overlapping community structure.
  International Conference on Artificial Intelligence and Statistics (AISTATS), 2019 (**oral**).
- Jay Heo*, Hae Beom Lee*, Saehoon Kim, **Juho Lee**, Kwang Joon Kim, Eunho Yang, and Sung Ju Hwang (*: equal contribution).

Uncertainty-aware attention for reliable interpretation and prediction.
Neural Information Processing Systems (NeurIPS), 2018.

- Hae Beom Lee, **Juho Lee**, Saehoon Kim, Eunho Yang, and Sung Ju Hwang.
  Dropmax: adaptive variational softmax.
  Neural Information Processing Systems (NeurIPS), 2018
- **Juho Lee**, Creighton Heakulani, Zoubin Ghahramani, Lancelot F. James, and Seungjin Choi.
  Bayesian inference on random simple graphs with power law degree distributions.
  International Conference on Machine Learning (ICML), 2017.
- **Juho Lee**, Lancelot F. James and Seungjin Choi.
  Finite-dimensional BFRY priors and variational Bayesian inference for power law models.
  Advances in Neural Information Processing Systems (NIPS), 2016.
- **Juho Lee** and Seungjin Choi.
  Tree-guided MCMC inference for normalized random measure mixture models.
  Advances in Neural Information Processing Systems (NIPS), 2015.
- **Juho Lee** and Seungjin Choi.
  Bayesian hierarchical clustering with exponential family: Small-variance asymptotics and reducibility.
  International Conference on Artificial Intelligence and Statistics (AISTATS), 2015.
- **Juho Lee** and Seungjin Choi.
  Incremental tree-based inference with dependent normalized random measures.
  International Conference on Artificial Intelligence and Statistics (AISTATS), 2014.
- **Juho Lee**, Suha Kwak, Bohyung Han, and Seungjin Choi.
  On-line video segmentation by Bayesian split-merge clustering.
  European Conference on Computer Vision (ECCV), 2012.

6 Research Projects

6.1 Ongoing projects

- Meta-learning algorithms for real-world problems (Apr 2022 - Dec 2024).
  Institute of Information & communications Technology Planning & Evaluation (IITP).
- Accelerating generation speed of diffusion-based generative models (Jul 2021 - June 2023).
  Naver (KAIST-NAVER Hypercreative AI Center).
- Bayesian inference for time-series data with missing values (Dec 2021 - Dec 2023).
  Samsung Electronics.
- Developing deep learning algorithm for anxiety disorder analysis using multi-modal data (Jul 2021 - Dec 2025).
  National Research Foundation of Korea.

- Developing artificial intelligence based emulator for physics processes in numerical models (May 2021 - Dec 2024).
  National Institute of Meteorological Sciences.
- Learning robust deep neural networks via bootstrap (Sep 2020 - Sep 2022).
  Samsung Electronics.

6.2 Past Projects

- Data-driven uncertainty quantification for deep learning (Jun 2021 - May 2021).
  National Research Foundation of Korea.
- Face clustering system with human tagging (Apr 2012 - Dec 2012).
  Samsung Digital Media & Communications Research & Development center.
- Incremental learning for face verification (Apr 2013 - Dec 2013).
  Samsung Digital Media & Communications Research & Development center.
- Basic software research in human-level lifelong machine learning (Apr 2014 - Feb 2018).
  Ministry of Science and ICT (MSIT)/IITP.
- Action recognition with smart devices (Aug 2015 - Jul 2016).
  Samsung Electronics.
- Incremental learning for deep learning based image classification systems with novel class detection (Mar 2016 - Dec 2016).
  LG Electronics.

7 Teaching Experiences

- Bayesian machine learning (AI701), KAIST (2020 Fall, 2021 Fall, 2022 Fall).
- Machine learning for AI (AI501), KAIST (2021 Spring, 2022 Spring).
- Lecturer for Samsung DS AI expert course (July 2020)
- Lecturer for deep learning/Tensorflow class in POSCO (Jun 2017)
- Lecturer for basic machine learning class in Samsung Research Study Center in GiHeung (Jul 2017)
- Lecturer for deep learning/Tensorflow class in Samsung Research Study Center in GiHeung (Jul 2017)

8 Skills

- Programming languages: MATLAB, C++, Python, Julia
- Deep learning libraries: Tensorflow, Torch, PyTorch, Theano

- Mathematical backgrounds: probability and statistics, stochastic process theory, linear algebra