SON VAN NGUYEN

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RESEARCH INTEREST

My research currently focuses on methods at the intersection of probabilistic modeling and deep learning, from which I aim to combine the complementary advantages of these two fields into modeling, inference, and learning. I am particularly excited about efficient and scalable probabilistic inference methods applied in complex settings of several domains such as Bayesian deep learning, deep generative models, hierarchical Bayesian models, and large-scale online/continual learning.

EDUCATION

University of Texas at Austin — Austin, USA
Ph.D. Student in Computer Science — Aug 2022 - Present
Advisors: Professor Qiang Liu, Professor Nhat Ho

Ha Noi University of Science and Technology (HUST) — Ha Noi, Viet Nam
Bachelor of Information Technology, Program of Talented Engineers — Aug 2014 - Jun 2019
Thesis title: "An effective Bayesian approach for discovering hidden semantics from data streams"
CPA: 3.50/4.00, Major CPA: 3.58/4.00 (rank 2/21 in the talented class), Thesis: 4.00/4.00 (Best Thesis Award)

Phan Boi Chau High School for the Gifted Students, *Specialized Math Class* — Nghe An, Viet Nam
Aug 2011 - Jun 2014

EXPERIENCES

VinAI Research (www.vinai.io) — Ha Noi, Viet Nam
AI Research Resident — Jul 2020-Jul 2022

- Main research topics: Bayesian Deep Learning, Deep Generative Models
- Advisor: Dr. Nhat Ho (Assistant Professor at UT, Austin)
- Knowledge gained: Advances in Bayesian Deep Learning (gradient-based MCMC, Variational Inference with dependence structure, principles of uncertainty estimation, applications in continual/active learning); Deep Generative Models (VAEs, GANs, Normalizing Flows, applications of Optimal Transport)

Applied Rotation Program — Sep 2021-Dec 2021

- Participate in Smart City project involving computer vision tasks such as face detection, face re-identification.

Data Science Laboratory (ds.soict.hust.edu.vn) — Ha Noi, Viet Nam
Research Assistant — Aug 2018 - Jul 2020

- Main research topics: Probabilistic Graphical Model, Bayesian inference
- Advisor: Dr. Khoat Than (Associate Professor at HUST)
- Knowledge gained: Foundations of Machine Learning, Deep Learning and Optimization; Bayesian inference (MCMC, scalable variational approximation, applications in hierarchical Bayesian models and online learning); Topic models (Latent Dirichlet Allocation)

Teaching Assistant — Jan 2020 - Jun 2020

- Machine Learning and Data Mining course

Viettel Network Technology R&D Center, *Department of Data Science* — Ha Noi, Viet Nam
Internship — Jun 2018 - Jun 2019

- Projects: analyze the consumer behavior in telecommunication of millions of users, develop recommendation algorithms for promotions

SUBMISSIONS

1. **Son Nguyen**, Khai Nguyen, Nhat Ho, "Amortized Bayesian Neural Networks", *To be submitted 2022*

PUBLICATIONS

1. Ha Nguyen*, Hoang Pham*, **Son Nguyen***, Linh Ngo, Khoat Than, "Adaptive Infinite Dropout for Noisy and Sparse Data Streams", *Machine Learning journal, 2022*

2. **Son Nguyen**, Duong Nguyen, Khai Nguyen, Khoat Than, Hung Bui*, Nhat Ho*, "Structured Dropout Variational Inference for Bayesian Neural Networks", *Advances in Neural Information Processing Systems (NeurIPS) 2021*

3. Khai Nguyen, **Son Nguyen**, Nhat Ho, Tung Pham, Hung Bui, "Improving Relational Regularized Autoencoders with Spherical Sliced Fused Gromov Wasserstein", *International Conference on Learning Representations (ICLR) 2021*

4. **Son Nguyen**, Tung Nguyen, Linh Ngo, Khoat Than, "Infinite Dropout for training Bayesian models from data streams", *IEEE International Conference on Big Data (Big Data) 2019*

TECHNICAL TALKS

1. Recent Advances in Deep Learning Uncertainty, *Data Science Lab - HUST* Nov, 2021

2. Structured Dropout Variational Inference for Bayesian Neural Networks, *VinAI NeurIPS Workshop* Nov, 2021

3. Uncertainty in Deep Learning and the case for Bayesian Deep Learning, *VinAI Research*, slide here Jun, 2021

4. Optimal Transport for Generative Modelling, *VinAI Research*, slide here Oct, 2020

PROFESSIONAL SERVICES

Thesis mentor for undergraduate students

- Ha Nguyen, Hoang Pham: Project "Online Bayesian inference methods for noisy and sparse data streams"
- Hoang Phan, Anh Phan: Project "Reducing catastrophic forgetting in neural networks via Gaussian mixture approximation"

AWARDS AND RECOGNITIONS

1. Vingroup Innovation Foundation (VINIF) Research Scholarship 2019, 2020

2. Best Thesis Award, Best Presentation Award for undergraduate student 2019

3. Third Prize in the Scientific Research Student Conference, HUST 2019

4. Scholarship for students with excellent academic records, HUST 2015, 2017

5. Vietnam Mathematical Olympiad for university students (VMS) 2015, 2016
(First Prize in Calculus, Second Prize in Algebra)

6. Scholarship of the National Program for the Development of Mathematics, Vietnam Institute for Advanced Study in Mathematics (VIASM) 2014, 2015

7. Second prize in Vietnam Mathematical Olympiad (VMO) for high school students 2014

EDUCATIONAL CONTRIBUTIONS

1. **Book:** Olympic mathematical topics for gifted students, 2 volumes, *Vietnam National University Press, Ha Noi.* Nguyen Dinh Thanh Cong, Nguyen Van Huong, Nguyen Duy Hung, Tran Tri Kien, **Nguyen Van Son**, Le Nhat, Tran Bao Trung Jul 2017

2. Book: Topics on combinatorics and complex numbers, *Vietnam National University Press, Ha Noi.* Tran Tri Kien, **Nguyen Van Son**, Le Nhat Jul 2016

3. Member of GSTT Group (a non-profit educational organization), lead refresher courses and consolidate the knowledge for high school students Oct 2014 - Oct 2015

SPECIALIZED AND LANGUAGE SKILLS

Programming skills:

- Proficient: Python (PyTorch, numpy, pandas, scikit-learn)
- Familiar: C, JAVA, LATEX

Languages:

- Vietnamese: Native
- English: IELTS 6.5 overall