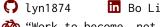
Bo Li, available from March-2024

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"Work to become, not to acquire"



Summary

I am a self-motivated, organised and dedicated Ph.D. (expected graduation in Jan 2024) with proven mathematical skills and a desire to learn more. I have 7+ years of experience using machine learning and deep learning for analysing various data types (medical images, Raman spectra, and surveillance videos). I am super fascinated by coding and very interested in analyzing real-world dataset.

Skills:

Machine/Deep Learning

Optimization

Federated learning

Uncertainty estimation

Anomaly detection PyTorch & Python | Computer vision | Spectroscopy analysis

Data Visualization

Education

2021 - 2024 Denmark

PhD, Technical University of Denmark Applied Mathematics and Computer Science Topic: Federated Machine Learning for Raman spectra and Surface-Enhanced Raman spectra (SERS)

2022 - 2023 Germany

▼ Visiting PhD student, CISPA Helmholtz Center for Information Security Topic: Accelerating the convergence of federated learning algorithms under high data heterogeneity

2016 - 2018 Denmark

M.Sc., Technical University of Denmark Mathematical Modelling and Computation Thesis: Active multitask learning for object recognition in images using deep neural networks

2012 - 2016 China

B.Sc., Jilin University Financial Engineering Thesis: The analysis of monetary factor in the context of capital market

Work Experience

2019 - 2021 Belgium

- Researcher Ghent University Imec, Supervisor: Dr. Sam Leroux, Prof. Pieter Simones Develop deep neural networks for detecting anomalies in surveillance videos under adverse weather
 - Develop distillation-learning based hardware-efficient framework for traffic counting

2018 - 2018 Denmark

- **Research Assistant** Technical University of Denmark, Supervisor: *Prof. Tommy Alstrom* • Explore uncertainty calibration within active learning for medical image segmentation
 - Develop region-based acquisition strategy to reduce labelling effort

2018 - 2022 Denmark

- **Teaching Assistant** Technical University of Denmark
 - Deep learning, 2021, 2023

 Bayesian machine learning, 2022

 Advanced data analysis, 2018
 Temporary
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Publications

- B. Li, Y. Esfandiari, M. N. Schmidt, T. S. Alstrøm, and S. U. Stich, Synthetic data shuffling accelerates the convergence of federated learning under data heterogeneity, 2023, arXiv: 2306.13263 [cs.LG].
- B. Li, M. N. Schmidt, T. S. Alstrøm, and S. U. Stich, "On the effectiveness of partial variance reduction in federated learning with heterogeneous data," in Proceedings of the IEEE/CVF Conference on Computer Vision and Pattern Recognition (CVPR), Jun. 2023, pp. 3964–3973.
- B. Li, G. Zappalá, E. Dumont, et al., "Nitroaromatic explosives' detection and quantification using an attention-based transformer on surface-enhanced raman spectroscopy maps," Analyst, 2023. 🔗 URL: http://dx.doi.org/10.1039/D3AN00446E.

- **B. Li**, M. N. Schmidt, and T. S. Alstrøm, "Raman spectrum matching with contrastive representation learning," *Analyst*, 2022. ODOI: 10.1039/D2AN00403H.
- **B. Li***, S. Leroux*, and P. Simoens, "Automated training of location-specific edge models for traffic counting," *Computers Electrical Engineering*, vol. 99, p. 107763, 2022, ISSN: 0045-7906.
- **B. Li***, S. Leroux*, and P. Simoens, "Multi-branch neural networks for video anomaly detection in adverse lighting and weather conditions," in *Proceedings of the IEEE/CVF Winter Conference on Applications of Computer Vision (WACV)*, Jan. 2022, pp. 2358–2366.
- **B. Li**, S. Leroux, and P. Simoens, "Decoupled appearance and motion learning for efficient anomaly detection in surveillance video," *Computer Vision and Image Understanding*, vol. 210, p. 103 249, 2021, ISSN: 1077-3142.
- **B. Li** and T. Alstrøm, "On uncertainty estimation in active learning for image segmentation," in Proceedings of 2020 International Conference on Machine Learning: Workshop on Uncertainty and Robustness in Deep Learning, 2020.

Projects supervision

- 2023, Project supervision: Explore the quality of the estimated uncertainty using federated learning
- 2 2023, Bachelor thesis: Explore representation learning in federated learning, Victor T. Olesen, and Rasmus S. Mikkelsen
- 3 2022, Project: Federated machine learning, Asger L. Schultz, Søren W. Holm, and Gustav L. Moesmand
- 2021, Project: *Unsupervised representation learning*, Till A. Aczel, Victor T. Olesen, Rasmus S. Mikkelsen, and David B. Ludvigsen
- 5 2021, Master thesis: Segmentation of cardiac structures based on MRI data using neural networks with analysis and evaluation of anatomical implausible segmentation errors (coding support), Katrine M. Ejlev and Michala Z. Blicher

Skills and hobbies

Languages Native Chinese, Proficient English, Basic Dutch (A1, 365+ streak on Duolingo)

Coding Python, PyTorch, R, Bash script, MATLAB, TensorFlow, Linux, GitHub, AWS, Plotly, JSON

Web Dev Basic level for React

Hobbies Yoga, read thriller books, hiking, sewing, and knitting

Awards

2016 – 2018 Danish Innovation Scholarship under DABAI

Referees

- 1. Associate Professor Tommy S. Alstrøm, Technical University of Denmark, 🔀 tsal@dtu.dk
- 2. Associate Professor Mikkel N. Schmidt, Technical University of Denmark, Mmsc@dtu.dk