WONHO BAE

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Research enthusiast interested in machine learning and computer vision,
particularly learning under low supervision such as **active learning** and **meta learning**
for both **discriminative** and **generative models**, based on **statistical learning** and **deep learning theory**.

EDUCATION

University of British Columbia *September 2020 - October 2025 (Expected)*
PhD of Computer Science *GPA: 4.00*

University of Massachusetts, Amherst *September 2018 - May 2020*
Master of Computer Science *GPA: 3.78*

University of California, Berkeley *September 2013 - December 2017*
Bachelor of Statistics *GPA: 3.76*

Santa Monica College *September 2011 - May 2013*
Associate of Economics, member of Alpha Gamma Sigma *GPA: 3.95*

RESEARCH EXPERIENCE

Apple ASR Data-Centric ML Team *August 2025 - Present*
AI/ML Resident
- Supervisor: Dr. Honza (Jan) Silovsky
- Conducted researches on federated learning to improve data efficiency, differential privacy and personalization for audio and speech recognition tasks.

Machine Learning Lab at University of British Columbia *September 2020 - August 2025*
Research Assistant
- Supervisor: Prof. Danica J. Sutherland
- Conducted researches on learning under low supervision such as i) semi and weakly-supervised learning, ii) meta learning, iii) active learning, as well as iv) deep learning theory. Recent focus is on data efficient learning for in-context and preference learning in Large Language Models (LLMs).

Borealis AI at Vancouver *May 2022 - September 2022, May 2023 - November 2024*
Research Intern
- Supervisor: Dr. Gabriel Oliveira, Dr. Fred Tung, and Dr. Mohamed Ahmed
- Conducted researches on i) temporal point processes (TPPs) to capture periodic patterns using neural process framework, ii) TPPs to predict long-term horizon using group-wise diffusion models, iii) difficulty-based regularization method, and iv) active learning robust to various budget regimes

Vision & Learning Lab at Seoul National University *February 2018 - September 2020*
Research Assistant
- Supervisor: Prof. Gunhee Kim
- Conducted researches on i) small object detection using GANs in the Faster R-CNN framework, and ii) object localization task under weakly-supervised learning setting using a class activation mapping method

Data Science for Common Good Fellowship at UMass, Amherst *May 2019 - August 2019*
Research Fellow
- Supervisor: Dr. Brant Cheikes, Prof. Matthew Rattigan
- Conducted a research on classifying wild animal images collected using camera traps in collaboration with The Nature Conservancy. Deployed a web-based open-source tool for ecologists

Renewable & Appropriate Energy Lab at UC Berkeley *January 2017 - December 2017*
Research Assistant
- Supervisor: Prof. Daniel Kammen, Prof. Deborah Sunter
- Participated in the Inclusive Green Growth project. Worked on keyword detection task using Natural Language Process techniques to replace synonyms and pronouns in the text

PUBLICATIONS

(* denotes equal contribution and ** denotes an important note)

[1] Jihyun Yu, Yoojin Oh, **Wonho Bae**, Mingyu Kim, Junhyug Noh, "SteeringTTA: Guiding Diffusion Trajectories for Robust Test-Time-Adaptation", **ICMLW 2025**, Vancouver, July 2025.

[2] **Wonho Bae**, Gabriel L. Oliveira*, Danica J. Sutherland*, "Uncertainty Herding: One Active Learning Method for All Label Budgets", **ICLR 2025**, Singapore, April 2025.
Note: This work has been filed for **U.S. patent**, November 2024.

[3] **Wonho Bae**, Junhyug Noh, Danica J. Sutherland, "Generalized Coverage for More Robust Low-Budget Active Learning", **ECCV 2024**, Milano, October 2024.

[4] **Wonho Bae**, Jing Wang, Danica J. Sutherland, "Exploring Active Learning in Meta-Learning: Enhancing Context Set Labeling", **ECCV 2024**, Milano, October 2024.

[5] **Wonho Bae**, Yi Ren, Mohamed Osama Ahmed, Frederick Tung, Danica J. Sutherland, Gabriel L. Oliveira, "AdaFlood: Adaptive Flood Regularization", **TMLR 2024**.

[6] Jing Wang, **Wonho Bae**, Jiahong Chen, Kuangen Zhang, Leonid Sigal, "What Has Been Overlooked in Contrastive Source-Free Domain Adaptation: Leveraging Source-Informed Latent Augmentation within Neighborhood Context", **TMLR 2024**.

[7] Mohamad Amin Mohamadi, **Wonho Bae**, Danica Sutherland, "A Fast, Well-Founded Approximation to the Empirical Neural Tangent Kernel", **ICML 2023**, Hawaii, July 2023.

[8] **Wonho Bae**, Mohamed Osama Ahmed, Frederick Tung, Gabriel Leivas Oliveira, "Meta Temporal Point Processes", **ICLR 2023**, Kigali Rwanda, May 2023.
Note: This work has been further developed into a **U.S. patent**, March 2025.

[9] Yi Ren, Shangmin Guo, **Wonho Bae**, Danica J. Sutherland, "How to Prepare Your Task Head for Finetuning", **ICLR 2023**, Kigali Rwanda, May 2023.

[10] Junhyug Noh, Kyung Don Yoo, **Wonho Bae**, ..., YonSu Kim, Gunhee Kim, "Predicting outcomes of continuous renal replacement therapy using body composition monitoring: a deep-learning approach", **Scientific Reports (2023)** by Nature Publishing Group.

[11] **Wonho Bae***, Mohamad Amin Mohamadi*, Danica Sutherland, "Making Look-Ahead Active Learning Strategies Feasible with Neural Tangent Kernels", **NeurIPS 2022**, New Orleans, November 2022.

[12] Jinhwan Seo, **Wonho Bae**, Danica J. Sutherland, Junhyug Noh, Daijin Kim "Object Discovery via Contrastive Learning for Weakly Supervised Object Detection", **ECCV 2022**, Tel-Aviv, October 2022.

[13] **Wonho Bae**, Junhyug Noh, Milad Jalali Asadabadi, Danica J. Sutherland, "One Weird Trick to Improve Your Semi-Weakly Supervised Semantic Segmentation Model", **IJCAI 2022**, Vienna, July 2022.

[14] **Wonho Bae***, Junhyug Noh*, Gunhee Kim, "Rethinking Class Activations Mapping for Weakly Supervised Object Localization", **ECCV 2020**, online, August 2020.

[15] Junhyug Noh, Kyung Don Yoo, **Wonho Bae**, ..., YonSu Kim, Gunhee Kim, "Prediction of the Mortality Risk in Peritoneal Dialysis Patients using Machine Learning Models: A Nation-wide Prospective Cohort in Korea", **Scientific Reports (2020)** by Nature Publishing Group.

[16] Junhyug Noh, **Wonho Bae**, Wonhee Lee, Jinhwan Seo, Gunhee Kim, "Better to Follow, Follow to Be Better: Towards Precise Supervision of Feature Super-Resolution for Small Object Detection", **ICCV 2019**, Seoul, October 2019.

WORK EXPERIENCE

OmniSync AI *October 2023 - Present*
Co-founder & Research Lead
- Founded AI startup, providing lip-synchronization service. Has led research and development to develop core AI models for lip-sync based on state-of-the-art generative models.

Republic of Korea Army *February 2015 - November 2016*
Signals Intelligence Analyst
- Served in the intelligence battalion of the Republic of Korea Army for 21 months as a signals intelligence analyst.

AWARD & SCHOLARSHIP

Mitacs program funding for two terms – CAD 30K *March - November 2024*
Mitacs funded research partnering with Borealis AI

NSERC AML-TN graduate trainee support – CAD 32K *October 2024 - October 2025*
Graduate trainee program with 1 year full stipend support

Learning from Imperfect Data (LID) Competition – 1st *June 2020*
1st place in LID workshop at CVPR 2020

Data Science for Common Good Fellowship *May 2019 - August 2019*
Research fellow in the Center of Data Science at UMass, Amherst

American Math Competitions *2011 - 2012*
3rd place in 2011 and 1st place in 2012

TEACHING

Teaching Assistant
Advanced Machine Learning (UBC: 2023), Computer Vision (UMass: 2019, UBC: 2021, 2022)

OUTREACH / PRESENTATIONS

Talk at Vancouver Machine Learning Reading Group at UBC *March 2025*
Presented multiple works on active learning mainly focusing on MaxHerindg and UHerding.

Talk at Borealis AI, Vancouver *September 2023*
Presented the work on "Meta Temporal Point Processes", ICLR 2023 at Borealis-UBC workshop.

Talk at ViewMagine (Online) *January 2021*
Presented "How to Access a Research Problem in Computer Vision" based on the publications from ICCV 2019 and ECCV 2020 and research design course in UMass.

AI Summer Seminar at UMass, Amherst *Summer 2019*
Hosted AI seminar at UMass during Summer of 2019. Discussed various topics related to AI including but not limited to computer vision, natural language process and planning.

Presentation for Inclusive Green Growth at Institute of Advanced Study, Germany *August 2018*
Presented a data-driven approach for measuring Inclusive Green Growth of different countries and regions at Hanse-Wissenschaftskolleg Institute for Advanced Study in Germany.

SERVICES

Paper Review
NeurIPS (2021-2025), ICML (2022-2025), ICLR (2023-2025), CVPR (2022-2023), TMLR (2025), AAAI (2025)

Recruiting Committee
UBC Graduate Recruiting and Admissions Committee (2023)
European Laboratory for Learning and Intelligent Systems (ELLIS) PhD Committee (2024)

Volunteer   *September 2022 - December 2022*
Mentor in Science Undergraduate Society Mentorship Program at UBC