

Randy Ardywibowo

Github: [ardywibowo](#) - Homepage: [ardywibowo.com](#) - Email: ardywibowo.randy@gmail.com

Education

Texas A&M University

Ph.D. in Electrical Engineering and Computer Science, **GPA: 4.0**

2017 - 2022

Work Experience

Apple Inc.

Cupertino, CA

Senior Machine Learning Engineer (Search & Language Understanding)

2022 – Present

- Developed Large Language Model (LLM) post-training techniques for language understanding and reasoning.
- Developed and productionized contextual bandits & off-policy reinforcement learning for alleviating bias.
- Researched LLM Reinforcement Learning for math, reasoning, and coding capabilities.
- Developed high-performance kernels and parallelization strategies to accelerate research (Triton kernels, FSDP, Tensor/Pipeline/Data Parallelism).

Texas A&M University, ECE Department

College Station, TX

Research Assistant (Variational Inference, Uncertainty Quantification)

2017 – 2022

- Growing Mixture of Experts (MoE) for continual learning using anomaly detection.
- Anomaly detection using Neural Architecture Search (NAS) for normalizing flows.
- Variational inference for dynamic & energy-efficient deep learning models.
- Uncertainty quantification for image segmentation using Bayesian neural networks.
- Time-series adaptive monitoring using Gaussian Processes and Kalman Filters.
- Co-authored proposals to DARPA & NSF.
- Applications: computer vision, time-series data, recommender systems.

Qualcomm Technologies Inc.

San Diego, CA

Research Intern (Camera Machine Learning)

2020

- Dynamic quantization and compression methods for energy-efficient computer vision models.
- Developed image super-resolution, segmentation, and classification models.

University of Washington

Seattle, WA

Research Scientist (Computer Vision, Healthcare)

2018

- Computer vision for automated surgical site infection detection, evaluation, and care.
 - Developed convolutional neural networks for skin disease image segmentation and classification.
 - 4th place in the 2018 International Skin Imaging Collaboration (ISIC) challenge.
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Research Interests

- Reasoning & Language Understanding
 - Reinforcement Learning
 - Contextual Bandits
 - Sampling Methods
 - Uncertainty Quantification
 - Variational Inference
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Publications

- **R. Ardywibowo**, R. Sunki, L. Kuo, S. Nayak, “BayesCNS: A Unified Bayesian Approach to Address Cold Start and Non-Stationarity in Search Systems at Scale”, AAAI 2025.
- **R. Ardywibowo**, “Learning under Data Irregularity and Uncertainty”, Ph.D. diss., 2022.
- **R. Ardywibowo**, Z. Huo, Z. Wang, B. Mortazavi, S. Huang, X. Qian, “VariGrow: Variational Architecture Growing for Task-Agnostic Continual Learning based on Bayesian Novelty”, ICML 2022.

- **R. Ardywibowo**, V. Dayana, H. Hwang. "Dynamic quantization for energy efficient deep learning." U.S. Patent Application No. 17/488,261.
- **R. Ardywibowo**, Z. Wang, B. Mortazavi, S. Huang, X. Qian, "VFDS: Variational Foresight Dynamic Selection in Bayesian Neural Networks for Efficient Human Activity Recognition", AISTATS 2022.
- **R. Ardywibowo**, Z. Wang, X. Qian, "NADS: Neural Architecture Distribution Search for Uncertainty Awareness," ICML2020.
- S. Boluki, **R. Ardywibowo**, S. Z. Dadaneh, M. Zhou, X. Qian, "Learnable Bernoulli Dropout for Bayesian Deep Learning", AISTATS2020.
- **R. Ardywibowo**, Z. Wang, B. Mortazavi, S. Huang, X. Qian, "Adaptive Activity Monitoring with Uncertainty Quantification using Switching Gaussian Process Models," AISTATS2019.
- Z. Jiang, **R. Ardywibowo**, A. Samareh, H. L. Evans, W. B. Lober, X. Chang, X. Qian, Z. Wang, S. Huang. "A Roadmap for Automatic Surgical Site Infection Detection and Evaluation Using User-Generated Incision Images." Surgical infections 20, no. 7 (2019): 555-565.
- **R. Ardywibowo**, C. Xiao, S. Gui, Y. Cheng, J. Liu, S. Huang, X. Qian, "Analyzing Daily Behavioral Data for Personalized Health Management," Journal of Healthcare Informatics Research, 1-20.
- **R. Ardywibowo**, "Analyzing Daily Behavioral Data for Personalized Health Management." B.S. diss., 2017.

Invited Talks

- **AstraZeneca Symposium**: "Bayesian Methods in Continual Learning", July 2022.
- **Indonesian Research Colloquium**: "Machine Learning under Uncertainty and Irregularity", July 2021

Service

- **Reviewer**: AAAI 2024, ICML 2023, Pattern Recognition 2023, AISTATS 2022, ICML 2022, AISTATS 2021, ICML 2021, NeurIPS 2021, AAAI 2020

Side Projects

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| OpenRL (Link) | 2024 |
| <ul style="list-style-type: none"> ▪ Developed library enabling rapid iteration of various RL methods for LLMs. ▪ Implemented PPO, RLOO, VinePPO, Linguistic Calibration, Generative Verifiers, Reward Modeling, etc. | |
| AutoInfra (Link) | 2023 |
| <ul style="list-style-type: none"> ▪ Automated DevOps, QA testing, and server diagnosis using LLMs. ▪ 2nd place in SHACK15 Hackathon (\$2000 prize). ▪ Backed by Y Combinator in YC23 batch (now innkeeper.ai) | |
| Triton Mode (Link) | 2023 |
| <ul style="list-style-type: none"> ▪ Implementation of various high performance Triton kernels. | |
| FrankCMS (Link) | 2017 |
| <ul style="list-style-type: none"> ▪ Developed a WordPress-like content management system from scratch using Node, Angular, and MongoDB. | |
| Robot Navigation and Mapping (Link) | 2016 |
| <ul style="list-style-type: none"> ▪ Developed a tele-operated robot that can autonomously map a building and identify lights in it. ▪ Implemented on device Simultaneous Localization and Mapping (SLAM). | |