Francis Boabang

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EDUCATION

Date	Qualification	Awarding Institution
2024	PhD. in Information and Systems Engineering	Concordia University, Canada
2016	Msc. Data Communication	Inje University, South Korea
2013	Bsc. Electrical/Electronic Engineering	Kwame Nkrumah University of Science and Technology, Ghana

PROFESSIONAL EXPERIENCE

Research Trainee	Alberta Machine Intelligence Institute
August 2025-Present	AMII Career Acceleration Program

Data Partner-Freelance	TELUS Digital Data Solutions
09/2025 – Present	Duties for Annotate & Label: Tag, categorize, and review text, images, and documents. Collect Data: Gather and organize high-quality datasets for AI training. Ensure Quality: Review and validate data for precision and consistency. Collaborate Globally: Work with an international team to hit project milestones.

Research Trainee	Summer School on Deep Learning and Reinforcement Learning, Alberta Institute of Machine Intelligence
July 21 2025 – 1st August 2025	Duties I participated in an intensive two-week program focused on the fundamentals and advanced concepts of Deep Learning and Reinforcement Learning with CIFAR Inclusive AI Scholarship (July 21st -1st August 2025) I worked on Reinforcement Learning and GNNs for predicting the effect of gene perturbations on developmental trajectories using single cell RNA seq data

Link to the github code and presentation:
https://github.com/boabangf/RNN_RL_gene_trajectory_perturbation.git

Collaboration	Toronto Metropolitan University
01/2025 – Present	Duties Designed and implemented an improved focal loss function, achieving a 10% performance enhancement over the standard focal loss approach in insurance fraud prediction.
Research Assistant	Concordia University, Montreal
2018 – 2020	Duties Developed ML models for remote robotic surgery, reducing packet loss by 20%. Applied AI to haptic feedback prediction in 5G networks.
Research Assistant	Korea Advanced Institute of Science and Technology (KAIST), South Korea
2016 – 2017	Duties Designed AI-based infrastructure for aircraft maintenance Developed strain gauges for predictive diagnostics
Research Assistant	Inje University, South Korea
2014 – 2016	Duties Worked on game theory signal processing in telecom networks Mentored students in AI programming

RESEARCH INTERESTS

Machine Learning, Game Theory, Convex Optimization, AI for Healthcare, Computational Biology, Robotic Surgery, Data Analytics

DATASETS USED

Medical Information Mart for Intensive Care (MIMIC-III)
JIGSAWS: The JHU-ISI Gesture and Skill Assessment Working Set
CIFAR 10/100
Mouse T-Cell Dataset
Auto Insurance Claim Dataset
Single Cell Dataset(RNA-seq, ATAC-seq)

CERTIFICATE COURSES

Year	Course Name
2021	Deep Learning Specialization – Coursera/DeepLearning.AI
2018	Machine Learning – Stanford Online (Andrew Ng)
2012	Cisco Networking Academy (Module 1-4)

SOCIETY MEMBERSHIP

IEEE, Black Professionals in Tech Network (BPTN)

PUBLICATIONS

Journal Publications

Boabang, F., Ebrahimzadeh, A., Glitho, R. H., Elbiaze, H., Maier, M., & Belqasmi, F. (2021). A machine learning framework for handling delayed/lost packets in tactile internet remote robotic surgery. *IEEE Transactions on Network and Service Management*, *18*(4), 4829-4845.

Boabang, F., Nguyen, H. H., Pham, Q. V., & Hwang, W. J. (2017). Network-Assisted Distributed Fairness-Aware Interference Coordination for Device-to-Device Communication Underlaid Cellular Networks. *Mobile Information Systems*, *2017*(1), 1821084.

Ph.D. Thesis

Boabang, Francis. *Refining Optimization Methods for Training Machine Learning Models: A Case Study in Robotic Surgical Procedures*. Diss. Concordia University Montréal, Québec, Canada, 2024.

Conference

Boabang, F., Glitho, R., Elbiaze, H., Belqami, F., & Alfandi, O. (2020, January). A framework for predicting haptic feedback in needle insertion in 5G remote robotic surgery. In *2020 IEEE 17th Annual Consumer Communications & Networking Conference (CCNC)* (pp. 1-6). IEEE.

Under Submission

Boabang, F. and Gyamera, S.A. An Enhanced Focal Loss Function to Mitigate Class Imbalance in Auto Insurance Fraud Detection with Explainable AI, under review at Issurance: mathematics and economics journal **https://arxiv.org/abs/2508.02283**

On-going Research Activity

Boabang, F. Enhanced Stochastic Gradient Descent. And Their Application to Predicting T-Cell Differentiation Using GNNs and Reinforcement Learning IEEE Transactions on Neural Networks. (Revising).

Francis Boabang, and Gyamera, S.A., Assessing Compression Strategies in Large Language Models for Symptom Extraction from Clinical Notes, (Revising-Available as preprint on ResearchGate)

AWARDS AND SCHOLARSHIPS

Year(s)	Award/Scholarship	Awarding Body	Value/Benefits	Role
2025	CIFAR Inclusive AI Scholarship	CIFAR	Tuition, Registration Fee, Airfare, Accommodation, Meals ($3,750 for 2 weeks)	Research Trainee
2018–2024	Concordia International PhD Fellowship	Concordia University	$20,000/year	Awardee
2015	ICT Expert Training Award	Ministry of Future Planning, South Korea	Research training support Accommodation, Meals Tuition, Transportation	Research Trainee
2013–2016	Korea Government Scholarship	Korean Government	Round-trip Airfare, Stipend, Tuition, Settlement Allowance ($11,000/year)	Awardee

INDICATIVE TEACHING EXPERIENCE

Institution	Year	Role	Level	Course Title	Class Size
Inje University	2015	Teaching Assistant	Graduate	Game theory and Optimization Techniques and Applications to Networking	31
Kwame Nkrumah University of Science and Technology, Ghana	2012	Teaching Assistant	Undergraduate	AI & Networking	75

ADMINISTRATIVE AND LEADERSHIP EXPERIENCE

Date	Role and Institution
2014	Mentorship Role for African Applicants to the Korean Government Scholarship Program
2018	Mentorship Role Supporting African Applicants Pursuing Scholarships at Canadian Institutions

CONFERENCE, WORKSHOP, AND RESEARCH PRESENTATION

2020
IEEE Consumer Communications & Networking Conference
January 2020 // Las Vegas, NV, USA (presentation)

2015
South Korea Multimedia Conference (Poster)

REFEREES

Available upon request