Changgang Zheng

Address: Flat 5, Thames Wharf, 3 Roger Dudman Way, Oxford, OX1 1AG, United Kingdom

Tel: (+44) 7410 499186 | Email: changgang.zheng@eng.ox.ac.uk

EDUCATION

University of Oxford

Degree: DPhil in Engineering Science   **Supervisor:** Professor Noa Zilberman

Thesis Topic: Towards in-network machine learning on programmable network devices   **10/2020-04/2025**

University of Electronic Science and Technology of China (UESTC)   **University of Glasgow (Glasgow)**

Degree: Bachelor Degree of UESTC in Engineering   **Degree:** First-class Honours Degree in Engineering

Overall GPA: 3.89/4.00 (Top 5%);   **Overall GPA in Glasgow:** 19.46/22.00 (Top 5%)

Program / Major: International Joint Bachelor Degree Program in Communication Engineering   **09/2016-06/2020**

University of British Columbia (UBC)   Jul. 2017 - Aug. 2017

➢ Summer Program

➢ Courses taken: Communication Systems-Technology Embedded in Daily Life; Introduction to Digital Systems Design with FPGAs

PUBLICATIONS

➢ **Changgang Zheng**, Noa Zilberman, et al. Planter: One Click In-Network Machine Learning. In preparation

➢ **Changgang Zheng**, Xinpeng Hong, Radostin Stoyanov, Damu Ding, Noa Zilberman, In-Network Machine Learning: A Survey. In preparation / Under submission

➢ **Changgang Zheng**, and Noa Zilberman. "Planter: seeding trees within switches." Proceedings of the *ACM SIGCOMM'21 Poster and Demo Sessions*. 2021. 12-14.

➢ **Changgang Zheng**, Shufan Yang, Juan Marcelo Parra-Ullauri, Antonio Garcia-Dominguez, and Nelly Bencomo. "Reward-Reinforced Generative Adversarial Networks for Multi-Agent Systems." *IEEE Transactions on Emerging Topics in Computational Intelligence*, 2021.

➢ **Changgang Zheng**, Han Liu, Mengyu Ge, and Yilin Liu. A novel maze representation approach for finding filled path of a mobile robot. *International Conference on Computer, Network, Communication and Information Systems (CNCI 2019)*. Atlantis Press, 2019.

➢ Noa Zilberman, **Changgang Zheng**, Zhaoqi Xiong, Thanh T Bui, Siim Kaupmees, Antoine Bernabeu, Shay Vargaftik, Yaniv Ben-Itzhak, ClassIC: Realizing In-Network Classification. Under submission

➢ Wei, Han, **Changgang Zheng**, Rui Zhang, Jinxia Guo, Qinli Yang, and Junming Shao. "Modular neural network via exploring category hierarchy." *Information Sciences* 569 (2021): 496-507.

➢ Wei Han, Christian Sorg, **Changgang Zheng**, et al. Low-rank network signatures in the triple network separate schizophrenia and major depressive disorder. *NeuroImage: Clinical*, 22:101725, 2019.

RESEARCH EXPERIENCE

In-network Machine Learning   Oct. 2020 – Present

Advisor: Prof. Noa Zilberman, University of Oxford

➢ Realise traditional in-network machine learning (ML) algorithms (SVM, Decision Tree, k-Means, Naïve Bayes, Neural Network, et al.).

➢ Development of in-network classification models with a focus on novel methodologies for mapping ensemble models (Random Forest and XGBoost) to programmable network devices.

➢ Offload some new ML algorithms to programmable network devices.

➢ Explore the deployment techniques and strategies of in-network ML algorithms.

This work resulted in a poster papar in *ACM SIGCOMM'21 Poster and Demo Sessions*.

History-Awareness Self-Adaptive System on Airborne base Station   Jun. 2019 – Sep.2020

Advisor: Prof. Shufan Yang, Capstone Project, UESTC

➢ Sought to identify how temporal graphs model would be applied to comprehend the model-free reinforcement learning aiming to achieve optimal inference and trajectory planning for telecommunication performance.

This work resulted in a journal papar in *IEEE Transactions on Emerging Topics in Computational Intelligence*.

Alzheimer's Disease Detection based on ADNI Dataset   Sep. 2017 – Sep.2020

Advisor: Prof. Junming Shao, UESTC

➢ Aimed to achieve alignment, extraction and judgment of AD disease features through deep learning by means of convolutional network. Overcame the overfitting and got rid of complex preprocessing that traditional neural image recognition needed to perform, contributing to earlier detection of AD disease, greatly reducing the demands for professional personnel.

This work resulted in a journal papar in *NeuroImage: Clinical*.

A Novel Maze Representation Approach to Seek for Filled Path of a Mobile Robot   Sep. 2017 - Jan. 2018

Team Leader. Advisor: Dr. Yingling Liang, UESTC

➢ Aimed to obtain the effective shortest path with the information of road width in the maze like image of urban roads, which can be used by mobile robots on the ground.

Elected by *National College Students' Innovation and Entrepreneurship Training Program*. Got rated Excellence in UESTC. This work resulted in a conference papar in *CNCI 2019*.

TALKS & PRESENTATIONS

➢ UK Academic Meeting on Systems and Networks (NGN21), "Planter: seeding trees within switches", 2021.

TEACHING EXPERIENCE

Circuit Analysis and Design Course, UESTC   **Chengdu, China**

Teaching Assistant to Dr. Francesco Fioranelli   Sep. 2018 - Jan. 2019

➢ Gave tutorial lectures and guided students in laboratory experiments.

HONORS & AWARDS

➢ ACM CoNEXT '20 Registration Grant (2020)
➢ USENIX NSDI '21 Registration Grant (2021)
➢ Honor of Liren Elite Student awarded by UESTC (top 1%, 2019)
➢ Excellent Consultant of Peer Support Center (only top 5% students qualified for the center, 2019)
➢ National Scholarship of China (top 1%, 2018, 2019)
➢ Honorable Mention in Mathematical Contest in Modeling (2018)
➢ Outstanding Innovation and Entrepreneurship Programs for College Students by UESTC (2018)
➢ The First Prize Scholarship awarded by UESTC (top 5%, 2017, 2018, 2019)
➢ Academic Scholarship awarded by UESTC (top 5%, 2017, 2018)
➢ Volunteering Service Scholarship awarded by UESTC (2017)
➢ Honor of Excellent Volunteer awarded by the Center Committee of Chinese Communist Youth League (2016)

SKILLS

✓ **Programming**: Proficient in Matlab, Python (scikit-learn, TensorFlow, PyTorch), P4, C, VHDL, Markdown, Latex, Shell script and familiar with R, Java

✓ **Professional Software**: Proficient in SPSS and AutoCAD

✓ **Hardware Design and Simulation**: Proficient in Simulink, Candance (mainly PSpice), Xilinx; familiar with Quartus