# Ziqi Zhao

RESEARCH INTERESTS: TRUSTWORTHY MACHINE LEARNING (ROBUSTNESS, PRIVACY), MODEL COMPRESSION

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## Education

**École polytechnique fédérale de Lausanne (EPFL)**                    *Lausanne, Switzerland*

MSc in Computer Science, GPA: 5.54/6. *Transcript*                    *Sept 2020 - Jan 2023*

- Specialization in Data Analytics

**École polytechnique fédérale de Lausanne (EPFL)**                    *Lausanne, Switzerland*

Exchange Program, GPA: 5.58/6. *Transcript*                    *Feb 2019 - July 2019*

- Courses: Artificial Neural Networks, Convex Optimization.

**Hong Kong University of Science and Technology (HKUST)**                    *Hong Kong SAR, China*

BSc in Computer Science and Mathematics (General Math Track), GPA: 3.62/4.3. *Transcript*                    *Sept 2016 - June 2020*

- First Class Honor, 1st Major (Computer Science) GPA: 3.79/4.3, 2nd Major GPA (Mathematics): 3.61/4.3

## Publications

"*" indicates equal contribution.

[1]   C. Liu*, **Z. Zhao***, S. Süsstrunk, and M. Salzmann, "Robust binary models by pruning randomly-initialized networks," in *Advances in Neural Information Processing Systems (NeurIPS)*, 2022.

[2]   W. Zhuo, **Z. Zhao**, K. H. Chiu, *et al.*, "Grafics: Graph embedding-based floor identification using crowdsourced rf signals," in *2022 IEEE 42nd International Conference on Distributed Computing Systems (ICDCS)*, IEEE, 2022, pp. 1051–1061.

[3]   J. Tan, E. Sumpena, W. Zhuo, **Z. Zhao**, M. Liu, and S.-H. G. Chan, "Iot geofencing for covid-19 home quarantine enforcement," *IEEE Internet of Things Magazine*, vol. 3, no. 3, pp. 24–29, 2020.

## Selected Research Projects

**Quantized Neural Networks for 6D Pose Estimation**                    *Lausanne, Switzerland*

Master Thesis at Computer Vision Lab, EPFL. Supervisor: Dr. Mathieu Salzmann. Score: 5.75/6                    *Aug 2022 - Jan 2023*

- Applied network quantization to 6D pose estimation models to improve efficiency.
- Analyzed the sensitivity of different parts of the network against quantization.
- Proposed a multi-stage quantization algorithm to improve 1%-5% accuracy for different models.

**Pushing the Limits of Optical Character Recognition on Complex Multilingual Documents**                    *Lausanne, Switzerland*

Semester Project at Digital Humanities Lab, EPFL. Supervisor: Prof. Frédéric Kaplan. Score: 5.75/6                    *Feb 2022 - June 2022*

- Finetuned Google Tesseract's OCR model for ancient Greek texts to improve overall recognition performance.
- Decreased the character error rate (CER) of Greek texts from 4.55% to 1.97% and that of the whole commentary from 8.07% to 3.28%.
- Developed an image pre-processing pipeline to further decrease the CER by 1%.

**Network Pruning in Adversarial Training**                    *Lausanne, Switzerland*

Semester Project at Image and Visual Representation Lab, EPFL. Supervisor: Prof. Sabine Süsstrunk. Score: 5.75/6                    *Feb 2021 - Oct 2022*

- Proposed an algorithm to find robust subnetworks from randomly-initialized binary networks based on Strong Lottery Ticket Hypothesis.
- Designed an adaptive pruning strategy to balance subnetwork search space and expression power.
- The binary subnetworks showed competitive performance among state-of-the-art full-precision ones and saved more than 30% FLOPs.
- This work has been published in **NeurIPS2022**: Robust Binary Models by Pruning Randomly-initialized Networks

**Floor Identification with Network Embedding**                    *Hong Kong SAR, China*

HKUST. Supervisor: Prof. Gary Shueng Han CHAN.                    *Feb 2021 - July 2022*

- Proposed a novel algorithm to efficiently and accurately identify a user's current floor using received Wi-Fi signals and limited labels.
- Modeled Wi-Fi signals as a bipartite graph and applied network embedding to solve the missing value problem.
- Achieved nearly 100% of identification accuracy and still have over 90% of accuracy when 70% of Wi-Fi access points are missing.
- This work has been published in **ICDCS2022**: GRAFICS: Graph Embedding-based Floor Identification Using Crowdsourced RF Signals.

## Work Experience

**Ketl.io**                    *Geneva, Switzerland*

Machine Learning Internship                    *July 2021 - Sept 2021*

- Developed several web crawlers to scrape and parse publicly available documents.
- Created a pipeline for text translation and summarization of nearly 500k documents in French, German, Italian and English.

## Skills

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| **Programming** | Python (with PyTorch, NumPy, Matplotlib, etc.), HTML/CSS, Javascript, Matlab, Java. |
| **Miscellaneous** | Linux, Shell (Bash/Zsh), Scripting language, LaTeX(Overleaf), Git. |
| **English Proficiency** | TOEFL: 102/120 (R29+L25+S23+W25). GRE: 324/340 (V154+Q170+AW3.5). |

## Achievements

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| 4 times | **University's Scholarship Scheme for Continuing Undergraduate Students (Top 10%)**, HKUST |
| 2019 | **Reaching Out Award**, Hong Kong Government |
| 2017 | **Dean's List in Engineering School**, HKUST |