
WORK EXPERIENCE

Intel Corporation*Staff Machine Learning Engineer / Technical Lead**Apr 2021 - present**Research Scientist**Oct 2018 - Apr 2021*

- Lead team of developers working on Intel HEXL, a **C++ homomorphic encryption** acceleration library using AVX512
- Lead developer of nGraph-HE, a **C++** DL compiler backend for private inference using **homomorphic encryption**
- Lead developer of Intel HE Toolkit
- Open-source contributor to SEAL and PALISADE homomorphic encryption libraries
- Directed \$100k research grant with Barcelona Supercomputing Center; collaboration with UCSD, TU Darmstadt

Tesla Motors*Summer 2017**Software Development Intern, Firmware: Maps & Navigation*

- Wrote vehicle firmware code (**C++**, Qt) to report navigation telemetry on company-wide website
- Implemented **Python** solution processing Apache Kafka stream of 150,000 trips daily
- Deployed solution with Kubernetes on AWS and Grafana for real-time visualization

Lyrical Labs*Summer 2016**Research and Development Intern*

- Developed 4K image segmentation algorithm using SLIC Superpixels and Extreme Learning Machines

Badgeville Inc.*Summer 2015**Software Development Intern*

- Predicted user churn and clustered users by behavior using Apache Spark, mongoDB, Hadoop, Scala

EDUCATION

Stanford University, 4.0 GPA*2017 - 2018**M.S. Computational and Mathematical Engineering, Data Science Track*

- Placed 2nd/180 in class competition to optimize Bayesian network

California Institute of Technology, 3.8 GPA*2013 - 2017**B.S. Computer Science, B.S. Applied and Computational Mathematics*

- TA'd 5 CS classes: graded 1100 problem sets, rated 4.7/5.0 by students
- NCAA DIII athlete: cross-country, soccer, track & field

SELECT PUBLICATIONS

Intel HEXL: Accelerating Homomorphic Encryption with Intel AVX512-IFMA52. Under review.

Enabling Homomorphically Encrypted Inference for Large DNN Models. IEEE Transactions on Computers 2021.

MP2ML: a Mixed-Protocol Machine Learning Framework for Private Inference. ARES 2020. Poster presentation at NeurIPS 2020 PPML. CCS 2020 PPMLP Workshop. Contributed talk at Crypto 2020 PPML.

nGraph-HE: A Graph Compiler for Deep Learning on Homomorphically Encrypted Data. CF 2019.

nGraph-HE2: A High-Throughput Framework for Neural Network Inference on Encrypted Data. WAHC 2019.

Parameter-free image segmentation with SLIC. Neurocomputing 277. 2018.

2 patents pending

Additional information on Google Scholar

SKILLS

Software: C++, CMake, Python, TensorFlow

Expertise: homomorphic encryption, privacy-preserving machine learning, deep learning, graph compilers

PROFESSIONAL ACTIVITIES

Program Committee / Reviewer: WAHC (2019, 2020), ICML (2021)