

Fabian Boemer

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WORK EXPERIENCE

Intel Corporation

Oct 2018 - present

Research Scientist

- Lead developer of nGraph-HE, a C++ DL compiler backend for private inference using **homomorphic encryption**
- 5 publications, 2 pending patents, served on 2 program committees
- Helped obtain and direct \$100k research grant with Barcelona Supercomputing Center
- **6x** improvement upon state-of-the-art throughput on CryptoNets network
- First homomorphic encryption evaluation of MobileNetV2 and ResNet50

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

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.

SKILLS

Software: C++, CMake, Python, TensorFlow

Expertise: homomorphic encryption, deep learning, graph compilers