Fabian Boemer

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WORK EXPERIENCE

Apple - Staff Cryptographer *Nov 2024 - present*

Apple - Senior Cryptographer *Nov 2021 - Nov 2024*

- Tech lead for Swift Homomorphic Encryption
- Co-authored Scalable Private Search with Wally

Intel Corporation - Senior (2019-2020) / Staff (2021) Machine Learning Engineer *Oct 2018 - Apr 2021*

- Tech lead for Intel HEXL, a **C++ homomorphic encryption** acceleration library using AVX512
- Tech lead for nGraph-HE, a **C++** DL compiler backend for private inference using **homomorphic encryption**
- Open-source contributor to SEAL and PALISADE homomorphic encryption libraries

Tesla Motors - Software Development Intern *Summer 2017*

- Wrote firmware (**C++**, Qt) for maps & navigation to report telemetry
- 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 - Research Intern *Summer 2016*

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

Badgeville Inc. - Software Development Intern *Summer 2015*

- 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

PUBLICATIONS

11 papers, 10 patents pending. Full list on Google Scholar.

- Scalable Private Search with Wally. 2024.
- Intel HEXL: Accelerating Homomorphic Encryption with Intel AVX512-IFMA52. WAHC 2021.
- 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 at NeurIPS 2020 PPML. CCS 2020 PPMLP Workshop. 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.

SKILLS

Software: Rust, Swift, C++
Expertise: homomorphic encryption, privacy-preserving machine learning, deep learning, graph compilers

PROFESSIONAL ACTIVITIES

Program Committee / Reviewer: FHE.org (2025), WAHC (2019 - 2022, 2024), ICML (2021), Journal of Cryptographic Engineering (2021)