

## Maxwell Horton

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## Employment

Senior Machine Learning Researcher/Engineer, at Apple 01/2020-Present

- Tech lead developing prototype machine learning experiences for unreleased products. Led the development of our product's machine learning pipeline, including designing the data collection, building the PyTorch training infrastructure, and training the models.
- Primary technical focuses include computer vision, deep learning, efficient machine learning on edge devices, object classification/detection/segmentation, facial recognition, video understanding, and audio understanding. Familiarity with language modeling and large-scale pretraining.
- Worked closely with application developers to define product requirements. Adjusted our model to perform better in challenging real-world scenarios through modeling techniques and data collection.
- Explored novel machine learning challenges not addressed by public research. Developed novel approaches based on experimentation and literature review. Published research at top-tier conferences, received patents (see below).
- Built and released open-source software to reproduce novel research.

Machine Learning Researcher/Engineering Lead, at Xnor.Ai 08/2017-01/2020

*Acquired by Apple in 01/2020.*

- Led a team of 5 people working on machine learning and infrastructure projects, including temporal object detection, aerial photo object detection, building efficient detection architectures, and real-time Facial Recognition on resource-constrained devices.
- Designed, implemented, and trained state-of-the-art deep learning models for deployment on edge device hardware. Built object detection and facial recognition solutions for commodity edge devices. Built keyword spotting solutions for a custom in-house FPGA-based neural network execution engine.
- Provided guidance to sales and marketing teams on Machine Learning capabilities and technologies. Built demos, spoke to customers, and trained specialized models designed for hardware targets.

Software Engineer, Full Time, at Facebook, Inc. 08/2014-06/2016

- Rewrote core allocation logic of Facebook's global load balancing system in C++ to improve performance and reliability.
- Analyzed traffic patterns to identify opportunities for algorithmic improvements.
- Maintained Facebook traffic service to worldwide users during oncall rotations.

## Education

University of Washington, Ph.D. 09/2016-06/2022

*Ph.D. done concurrently with employment at Xnor.Ai and Apple.*

- **Department:** Computer Science and Engineering. **Areas:** Machine Learning, Computer Vision
- Earned Ph.D. (06/2022) and Master's degree (06/2018). **GPA:** 3.9
- Research focused on model compression in challenging data-constrained and data-free scenarios.

California Institute of Technology, B.S. 09/2010-06/2014

- **Majors:** Computer Science & Physics. **GPA:** 3.8

## Technical Skills, Publications, Patents

- **Languages:** Python, C++14, C, Bash. **Frameworks:** PyTorch, NumPy, Kubernetes, Docker.
- **Publications:** My public-facing research focuses on model compression and model understanding. See <https://scholar.google.com/citations?hl=en&user=zP3Rp-MAAAAJ> for publications.
- **Patents Filed:** Model Selection Interface (62/667991), Improving Image Classification through Label Progression (US19/28570), Detecting Fake Videos (16/539430), Generating a Customized Machine-Learning Model to Perform Tasks Using Artificial Intelligence (US19/31160).