Jared T Nielsen

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EXPERIENCE

BYU Perception, Control and Cognition Lab
Machine Learning Researcher

Sep 2018 - Present
Provo, UT

- Predicting and preventing equipment failure for a semiconductor manufacturer (Texas Capitol Semiconductor) via piecewise linear regression and anomaly detection; each super-cooling pump preserved saves ~$50,000.
- Leading a team of three researchers to design semi-supervised machine transcription of spoken audio into phonemes (speech units), which include linguistic accents.
- Explored "complex CNNs" for image recognition using the 2D Fourier transform as a preprocessing step. Theorized alternative activation functions and convolution operators using TensorFlow, Keras, and TensorBoard.
- Implemented biomedical image segmentation model, the U-Net, to detect cancerous regions in cell tissue images.

Microsoft
Software Engineer Intern

May 2018 - Aug 2018
Lehi, UT

- Enabled ~$100,000 in immediate monthly recurring revenue by supporting 1,000 licenses and 25,000 devices.
- Implemented a custom network connection type for enterprise security software (Intune & Zscaler VPN).
- Communicated clearly with external vendor to develop and test cross-platform integration.
- Learned massive-scale version control, unit/integration testing, and microservice architectures.

MantisX
Lead Software Developer

Jun 2016 - May 2018
Chicago, IL

- Constructed and maintained a live production database handling 25,000 unique users and 8 million shots for a firearms training system startup.
- Improved shot detection accuracy by ~50% with a convolutional neural net, then deployed the TensorFlow Lite model on iOS and Android.
- Engineered a competitive private group web platform using Python, Amazon Web Services, and PostgreSQL; this opened a new market segment and negotiations with both Cabela's and the U.S. Marines.
- Led a team of three developers to establish stable APIs and secure authentication between web and mobile.

PROJECTS/AWARDS

1st **place Virginia Science Fair 2013**: Othello AI player via game tree search with alpha-beta pruning.

1st **place BYU New Venture Challenge 2018**: *Fresh Stamp*, a novel barcode format to encode scanner-readable expiration dates into food packaging. Took 8th place in the Miller Competition Series.

1st **place Microsoft Hackathon 2018**: Integrated Cortana into a Raspberry Pi, winning a team-wide hackathon.

Open Source Contribution: Added one-sided truncated Gaussian mixture model to *hyperopt*, a hyperparameter optimization framework with 3,000 GitHub stars.

March Madness Prediction: Modified Google's PageRank algorithm to track basketball team strength instead of website popularity, then competed in ESPN's bracket challenge.

Facial Recognition: Applied principal component analysis and the eigenface method to identify the most similar face in an existing database of profile images.

SOFTWARE SKILLS

Languages: Python, Java, C#, C++, SQL, HTML5, CSS, JavaScript

Frameworks: PyTorch, TensorFlow, Keras, Git, AWS, Django, NumPy, PostgreSQL

EDUCATION

M.S. Computer Science
Brigham Young University

Dec. 2020
Provo, UT

B.S. Applied and Computational Mathematics
Brigham Young University; GPA: 3.82

Apr. 2019
Provo, UT