John Day

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EDUCATION

University of Michigan **Ann Arbor, MI**

- Dual Degree: Computer Science and Neuroscience – GPA: 3.5/4.0 **Spring 2020**
- Relevant Coursework: Data Structures & Algorithms, Computer Organization, Machine Learning, Computer Vision, Web Systems, Computer Security, Discrete Math, Linear Algebra, Cell & Molecular Neuroscience, Behavioral Neuroscience, Linguistic Analysis, Minds & Machines

TECHNICAL SKILLS

Proficient: C++, Python, MATLAB, Git, Unix shell; **Experience:** C#, C, PyTorch, TensorFlow, Unity, SQL, .NET, VR/AR

RESEARCH EXPERIENCE

Computer Aided Diagnosis (CAD) Research Lab & Luker Lab – University of Michigan **Summer 2019 – Present**
Research Assistant

- Developed software to segment cell nuclei in both 2D and 3D imaging using a Deep CNN (U-net architecture)
- Implemented data processing algorithms incl. sliding window, enabling input of images of any size for our model without loss of data; new techniques showed improved model accuracy compared with traditional resizing algorithms
- Coordinated collaboration effort between two research labs on the project and lead the writing of a manuscript in preparation for publication

Life Sciences Institute, S. Xu Lab - University of Michigan **Fall 2016 – Fall 2018**
Research Assistant on Improved Behavioral Analyzation Methodology using Machine Learning with Dr. Adam Iliff

- Designed Matlab program using transfer learning on a pre-trained deep neural net to track worms from video recordings and predict specific behavioral features; spoke about project at multiple conferences nationwide
- Experimented with current and potential approaches to automatic behavior interpretation for methodology optimization

Research Assistant on Novel Sensory Transduction in C. elegans with Dr. Adam Iliff

- Investigated possible sensory receptors responsible for the sensory transduction of baroreception in the model organism
- Conducted behavioral assays on candidate null mutants and analyzed differences in behavioral response data, providing the lab a refined understanding of the unknown sensory mechanism and involved genes

MCubed Research Fellowship - Dr. Mark Lindquist and Dr. Bruce Maxim **Summer 2017**

- Designed study to evaluate how perceiving experiences with VR affected physiological state
- Built VR environments using Unity and C# for Oculus Rift to support the study

INDUSTRY EXPERIENCE

Neurable Inc. **Boston, MA**
Backend Software Development Intern **Summer 2018**

- Built application for sending live brainwave (EEG) data across computers and integrating the data into the API, allowing Neurable to work on mobile devices such as Microsoft HoloLens and Android phones; built using Unity, C#, and TCP
- Designed tests to assess the generalized performance of machine learning algorithm using exhaustive cross-validation
- Optimized Neurable's architecture by allowing for parallelized training and testing of ML models

ACTIVITIES

Neuroprosthetics Club - Software Team Lead

- Construct executable plans to achieve the goals of the team each week, distributing tasks to 10+ other software members
- Researching signal processing techniques to improve user control of prosthetic device from electrophysiological data

MUSIC Matters - Community Service Organization

- Organize music festivals and other fundraising events that support service projects and local community scholarships

PROJECTS

- Computer vision program for animal tracking
  - Used to track worm (*C. eligans*) movement in neurobiology research studies
- Optical Music Recognition application
  - Computer vision pipeline which, given a camera photo of sheet music, outputs the audio encoded in the notes
- *My Memorizer Tool* – Google Chrome extension employing the psychological spacing effect for convenient and effective memorizing of content on the Web. Published and available on the Chrome Web Store

ACHIEVMENTS

- 2nd place in international poster presentation competition at CeNeuro *C. elegans* Neuroscience Conference 2018
- Poster presentation at the regional Midwest *C. elegans* Meeting
- Ted Bates Memorial Community Service Award: For significant dedication to volunteer service