Joseph Antognini

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Education

Ph.D., Astronomy, The Ohio State University, 2016

B.S. *cum laude*, Astrophysics, California Institute of Technology, 2010

Employment

July 2017 – Google Inc., Google AI Resident

January 2016 – July 2017 Persyst, Lead Computational Scientist

Selected Projects

August 2017 –
Performed large-scale experiments to understand the relationship between minibatch size and training time in neural networks. Implemented Resnet-50-v2 in Tensorflow and performed $\sim 10^4$ Imagenet experiments on TPUs.

August 2017 – February 2018
Developed a technique to extend neural texture synthesis to audio data. Implemented Tensorflow code to take a "textural" audio clip and extend it arbitrarily.

January 2016 – June 2017
Developed a deep convolutional neural network that robustly detects QRS complexes (i.e., heartbeats) in noisy EKG data using Tensorflow. This project involved overseeing the assembly and labeling of the dataset and integrating the new QRS detector into the existing C++ codebase. This neural network achieved an error rate 9 times lower than the benchmark open source QRS detection software, EP Limited, which implements the standard Pan-Tompkins algorithm.

November 2016
Implemented backprop in C++ for a novel NN architecture called a "preferred NN". (A preferred NN is similar to a Siamese NN but with symmetric connections between the two "twins".) This project also involved implementing the training architecture, including the Adam optimizer.

March 2014 – May 2015
Performed the first comprehensive study of scattering of triple star systems by running $\sim$300 million numerical N-body scattering experiments using $\sim$30 CPU-years of computing time at the Ohio Supercomputer Center and the Ohio State Astronomy Department Condor Network.

June 2014 – August 2014
Modeled data of patient arrival times and wait times to optimize the number of operating rooms at the UC Davis Medical Center using Python and Mathematica.

December 2012 – August 2014
Discovered a new three-body dynamical phenomenon by running and analyzing the long-term N-body evolution of several thousand hierarchical triples by rewriting the `fewbody` C program and using $\sim$2 CPU-years of computing time on the Ohio State Astronomy Department Condor Network.

Please see my website for a list of my publications.