Brandon McKinzie

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RESEARCH AND WORK EXPERIENCE

UC Berkeley - Automated Deep Learning Architecture Generation *September 2016 - Present*
Writing software to automate generation and evaluation of deep neural network architectures.
The project is written in Scala, and the architectures are converted into Python TensorFlow code.
Gained experience with both using and modifying the tflearn python libraries.

Massachusetts Institute of Technology - Living Mobile *Summer 2016*
Designed virtual training environments that utilized the HTC Vive and IMUs.
Built circuits containing inertial measurement units, bend sensors, and Arduinos.
Gained experience developing with the Unity3D game engine and C#.

Massachusetts Institute of Technology - Heavy Ion Group *Summer 2016*
Implemented clustering algorithm in C++ for the SPHENIX collaboration.
Designed cluster visualization software for exploratory data analysis.
Integrated code modules within the SPHENIX software framework.

Lawrence Berkeley National Laboratory - Relativistic Nuclear Collisions *January 2015 - June 2016*
Built a model of large-angle jet scattering to infer properties of 2014 ALICE data at the LHC.
Primary contributor to the R&D team for the Event-Plane Detector at STAR.
Optimized topological cuts for D0 meson decays detected at STAR.
Member of the ALICE collaboration at the Large Hadron Collider.
Member of the STAR collaboration at the Relativistic Heavy Ion Collider.

Brookhaven National Laboratory - SULI Program *June 2015 - August 2015*
Employed novel lattice QCD techniques to compute the proton isovector scalar charge.
Computed the pion mass from a set of simulated gauge configurations.
Studied modern methods for calculating nucleon form factors.

UC Davis - Nuclear Physics Group *August 2013 - August 2014*
Provided first estimate for the systematic uncertainty of Upsilon polarization at CMS.
Optimized effective signal of Upsilons produced at $\sqrt{s_{NN}} = 200$ GeV in 2012 p-p STAR dataset.
Experienced with Glauber Modeling and Monte Carlo methods for analyzing collision centralities.

Folsom Lake College - Tutoring Center *August 2013 - May 2014*
Lead tutor for Departments of Physics, Mathematics, and Chemistry.
Held walk-in and private tutoring sessions daily.
Organized class/group tutoring sessions weekly.

EDUCATION — *Graduating December 2016*

U.C. Berkeley
Fall 2014 - Present
Physics major, 3.87 GPA
Computer Science minor

Los Rios Community Colleges
Spring 2013 - Spring 2014
Physics major, 4.0 GPA
Research Club member

American University
Fall 2012 (Washington D.C.)
Political Science major, 3.6 GPA
Congressional Intern

AWARDS

Laslett Scholar	Academic Achievement – Berkeley Physics Department	*Fall 2015*
Helen Quinn Award	Best Undergraduate Theoretical Research – APS Meeting	*Fall 2014*
Longest-Serving Intern	Congressman Dan Lungren – Sacramento/Washington DC	*Fall 2012*

COMPUTER SKILLS

Programming Languages	Strong proficiency: C, C++, Java, and Python (numpy, scipy, etc). Working proficiency: HTML/CSS, JavaScript, R, MATLAB.
Linux	Experienced with advanced BASH scripting and Unix customization. Primary distributions: Arch, CrunchBang, and Ubuntu derivatives.
Miscellaneous	Experienced with writing Vimscript/Vim plugins and LaTeX packages. Use TensorFlow (Python) libraries in coursework/free time. Highly experienced with the ROOT C++ data analysis framework.

NOTEWORTHY COURSEWORK

Machine Learning (In Progress)	Classification, regression, density estimation, clustering, dimensionality reduction.
Artificial Intelligence Grade Received: A	Search algorithms, Markov decision processes and reinforcement learning. Bayes' nets, machine learning, and deep learning.
Neural Computation (In progress)	Sparse coding, RNNs, Boltzmann Machines, and dynamical models. Hebbian learning, autoencoders, and locally competitive algorithms.
Data Structures Grade Received: A	Designed text editor in Java supporting word wrapping, text selection, etc. Built mapping application supporting rastering, routing, autocomplete search, etc.
Quantum Computing Grade Received: A	Emphasis on quantum computational algorithms and efficiency. Models for quantum error correction and complexity theory.
Laboratory Experience Grades Received: A, A	Hands-on preparation for experimental physics research. Data collection/analysis, equipment operation, and error analysis.
Particle Physics Grade Received: A	Feynman calculus, cross sections, decay rates, and fundamental interactions. Quantum field theory, gauge theories, symmetry breaking, and more.
Adv. Linear Algebra Grade Received: A	Emphasis on formulating proofs with advanced notation. QR factorization, rayleigh's principle, Jordan canonical form, etc.