

# Brandon McKinzie

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## EDUCATION

### UC BERKELEY

B.A. IN PHYSICS

MINOR IN COMPUTER SCIENCE

Dec 2016 | Berkeley, CA

GPA: 3.82

## LINKS

Website: [mckinziebrandon.me](http://mckinziebrandon.me)

Github: [mckinziebrandon](https://github.com/mckinziebrandon)

LinkedIn: [mckinziebrandon](https://www.linkedin.com/in/mckinziebrandon)

Quora: [Brandon-McKinzie](https://www.quora.com/Brandon-McKinzie)

## COURSEWORK

### COMPUTER SCIENCE

Artificial Intelligence

Machine Learning

Neural Computation

Quantum Computing

Data Structures & Algorithms

Machine Structures

Interp. & Struct. of Computer Programs

### PHYSICS

Advanced Electrical Laboratory

Advanced Experimentation Laboratory

Statistical and Thermal Physics

Particle Physics

### MATHEMATICS

Discrete Math & Probability Theory

Advanced Linear Algebra

Differential Equations

Calculus I, II, III

## SKILLS

### LANGUAGES

Strong Proficiency:

C/C++ • Java • Python

Working Proficiency:

HTML/CSS • JavaScript • Scala

Familiar/Prior Experience:

MySQL • R • MATLAB

### MISCELLANEOUS

Fluent in numpy/pandas/matplotlib

Avid TensorFlow programmer

Advanced BASH scripting

Linux/Vim/L<sup>A</sup>T<sub>E</sub>X enthusiast

## RESEARCH AND WORK EXPERIENCE

### AUTOMATIC GENERATION OF DEEP NEURAL NETWORKS

UC Berkeley | Advised by Prof. Dawn Song | Sep 2016 – Dec 2016

- Implemented support for early-stopping during architecture search process.
- Extended the set of allowed merge operations between network layers.
- Refactored initial codebase to improve stability & scalability.

### VIRTUAL TRAINING WITH THE HTC VIVE

MIT Media Laboratory | Living Mobile Group | Summer 2016

- Designed virtual training environments in Unity3D for use with the HTC Vive.
- Implemented support for full-body tracking with personalized avatars.
- Built circuits containing inertial measurement units and bend sensors fed to Arduinos for tracking location, orientation, and geometry of the user.

### CLUSTERING ALGORITHM – SPHENIX COLLABORATION

MIT | Heavy-Ion Group | Summer 2016

- Implemented a photon clusterizer (C++) for the sPHENIX collaboration.
- Designed cluster visualization software and user interface.
- Tested clusterizer on simulations within the RCF global computing grid.

### EVENT GENERATION & JET FINDING

Berkeley National Lab | Relativistic Nuclear Collisions | Jan 2015 - June 2016

- Built an event-generator (C++) for identifying jets in terabytes of LHC data.
- Primary contributor to design and 3D-printing of Event-Plane Detector (STAR).
- Used NERSC supercomputers on datasets containing billions of high-energy particle collisions to optimize topological cuts for D0 meson decays.

### LATTICE QUANTUM CHROMODYNAMICS COMPUTING

Brookhaven National Lab | Advised by Dr. Meifeng Lin | Summer 2015

- Analyzed simulated gauge configurations from the BNL supercomputing facility.
- Employed Monte-Carlo sampling techniques with jackknife statistics and all-mode averaging to obtain high-precision estimates.
- Implemented numerical approximation techniques in C and analyzed simulation outputs with the ROOT data-analysis framework (C++).

### COMPUTATIONAL NUCLEAR PHYSICS

UC Davis | Nuclear Physics Group | Aug 2013 - Aug 2014

- Computed 1<sup>st</sup> systematic uncertainty estimate of Upsilon polarization at CMS.
- Optimized effective signal of Upsilon's produced in 2012 p-p STAR dataset.

## PERSONAL PROJECTS

### CONVERSATION MODELS IN TENSORFLOW

Links: [DeepChatModels](https://github.com/DeepChatModels) | [deepchatmodels.appspot.com](https://deepchatmodels.appspot.com)

- User-friendly API for building sequence-to-sequence conversation models.
- Performance-optimized input pipeline and model serialization.
- Custom TF ops for 3D sampled softmax, dynamic decoding, and more.
- Models deployed on Heroku servers in Flask web application.

## AWARDS

2015 Dean's Honor List & Laslett Scholar – UC Berkeley

2014 Best Undergrad. Theoretical Research – American Physical Society Conf.

2012 Longest-Serving Intern – Congressman Dan Lungren