

# Wenyang Qian

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📄 [wenyang0407](#) • [in](#) Wenyang Qian

- Hands-on experience with machine learning in Python, high performance computation in Fortran, data analysis/modeling in Mathematica, backend web developments in JavaScript (Node.js) and Python.
- Solid background in algorithm, data structure, relational database, statistics.
- Proficient in Python, JavaScript, MySQL, Fortran, Mathematica, HTML, CSS.
- Advanced knowledge in Java, R, MongoDB, C#, Machine Learning, Django, Linux/Unix, Git.
- Experienced in collaborations and highly-motivated in learning new technologies.

## Education

### Iowa State University

*Ph.D. candidate in Nuclear Physics. Professional Development Grants.*

**Ames, IA**

*2014 – present*

### University of Virginia

*M.A. in Physics. Departmental Fellowship.*

**Charlottesville, VA**

*2012 – 2014*

### Grinnell College

*B.A. in Mathematics and Physics. Dean's List. Phi Beta Kappa Honors.*

**Grinnell, IA**

*2008 – 2012*

## Research Experience

### Iowa State University

*Graduate Research Assistant*

**Ames, IA**

*2014 – present*

- Developed an effective model to improve the predictions of meson systems by implementing high performance programs in Fortran with OpenMP and MPI on parallel supercomputer clusters, and obtained an optimized r.m.s. deviation of 77 MeV for the lowest 8 masses, for the first time.
- Analyzed large datasets of numerical computational results with Shell scripts and Mathematica to probe the internal structure of mesons. Produced crucial quantitative observables within 1 standard deviation of experimental observations via a sequence of feature selections, data visualizations, and parameter optimizations.
- Designed a relativistic Yukawa interaction to describe hydrogen isotopes, and improved the previous classical model by 0.7% with Monte Carlo numerical integration method in Fortran.

## Featured Projects

### **Ecosystem: Web Application (JavaScript)** [↗](#)

*Aug – Nov, 2018*

- Designed and developed a mobile-friendly RESTful web application with Node.js using Express framework that allows users to keep a digital record of animals and plants.
- Optimized the database efficiency by modifying design patterns and migrating from MySQL to MongoDB. Improved overall query performance by 72% with Mongoose.
- Improved client-side experience by implementing User Authentication, User Authorization, responsive Google API, and error handling.

### **Shape Recognition, with Machine Learning (Python)** [↗](#)

*May – July, 2018*

- Extracted 640 hand-drawn geometric shapes from public surveys and produced a clean dataset for public usage with Pillow Image processing library.
- Developed Python codes and used SciPy, Scikit-learn libraries to differentiate 8 geometric shapes using traditional Machine Learning methods such as Nearest Neighbor, Generative Model, Support Vector Machine, Multi-class Perceptron algorithm, and reached a minimum error rate of 1.25% by 4-Fold Cross Validations.
- Built Densely-connected Neural Network and Convolutional Neural Network with TensorFlow. Obtained an improved accuracy of 99.38% within 700 iterations.

### **Many-body Interaction Matrix Toolkit (Mathematica), Ames, IA**

*Dec, 2016*

- Developed a Mathematica package that utilizes its power in symbolic operations to compute interaction matrix element directly from Feynman diagrams, which significantly reduced the time for complex derivations in theoretical physics from hours to fractions of a second.
- The package is actively used by research group members in solving bound-state particles, such as Charmonium, Bottomonium, and Baryons (protons and neutrons).