Yongjin Jiang

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Portfolio: https://yongjinjiang.github.io/portfolio/

Personal Statement

Data Scientist with nearly twenty years' experience in coding and modeling in the field of theoretical physics. Successfully published about 30 scientific papers and won an outstanding researcher award. A graduate from the University of Minnesota, *Data Visualization and Analytics* Program. Proven ability in performing data visualization &analytics using Python, JavaScript, R, Tableau, MySQL/MongoDB, Machine Learning/Deep Learning, and more. A creative, critical thinker and an efficient learner in employing advanced skills to implement automation and maximize scalability and drive feasible results.

Education/Certificates

- Data Visualization and analytics Bootcamp(finished), University of Minnesota *2018.8-2019.2*
  A 24-week intensive program focused on gaining technical programming skills in Excel, VBA, Python, R, JavaScript, SQL Databases, Tableau, Statistics, Big Data and Machine Learning.
- Deep Learning Specialization(finished), Coursera online course *2018.10-2019.2*
  Learned about Convolutional networks, RNNs, LSTM, Adam, Dropout, BatchNorm, Xavier/He initialization, and more. Worked on case studies from healthcare, autonomous driving, sign language reading, music generation, and natural language processing. Mastered not only the theory, but also how it is applied in industry.
- Ph.D. in Theoretical Physics, Fudan University (Top 5), China 2002.7

Experience

- Data Visualization and analytics Bootcamp, University of Minnesota *2018.8-2019.2*
- Visiting Professor, Ningbo Institute of Industrial Technology, Chinese Academy of Sciences *2018.1-2018.5*
- Postdoc Associate & Visiting Scholar, National Sun Yat-sen University（Taiwan) *2017.9-2017.12*
- Postdoc Associate & Visiting Scholar, University of Minnesota *2015.1-2017.6*
- Faculty, Physics department of Zhejiang Normal University *2004.9-2014.12*
- Postdoc researcher, Tsinghua University (Top 2, China) *2002.1-2004.8*

Skills

- *Databases:* MySQL, MongoDB, SQLite
- *Programming:* Python, JavaScript, Excel/VBA, R, Tableau, MATLAB, Mathematica, Fortran
- *Machine Learning:* Linear Regression, knn, decision tree, Random forest, SVM, Convolutional Neural Network (CNN), Recurrent Neural Network (RNN), Scikit-learn, TensorFlow, Keras
- *Mathematics:* Calculus, Linear Algebra, Complex Function Analysis, Group Theory, Numerical Optimization, Numerical Linear Algebra, Green's function, Kernel Methods
- *Theoretical Physics:* Statistical Mechanics, Quantum Mechanics, Electrodynamics, Solid State Theory, Quantum transport theory, Superconductivity, Topological Band theory, Monte Carlo simulation
- *Others:* Social data mining, git/GitHub, Heroku, Jupyter notebook, google cloud platform

Selected Projects in two different areas:

1. **Data Visualization& Data Analytics (**All the following six are personal projects, with key techniques highlighted**)**

- D3 Journalism 2018 (link) (*Demo*)
  *An **interactive data visualization** tool is provided for a series of feature stories about the health risks facing particular demographics of the United states**. Selectable features** for both axes. **d3.js** is heavily used in this app.*
- Global Earthquake Map 2018 (link) (*Demo*)
  *A **real time global earthquake map** (for past 7 days) is shown with a dropdown for layer choice. **Leaflet.js** and **GeoJSON** data format is leveraged upon.*
- MySQL project 2018 (link)
  ***MySQL** queries for a database, a standard schema that can be used for examples in books, tutorials, articles, etc.*

- Pandas: Heroes Of Pymoli 2018 (link) (*Demo*)
  *A typical **Python pandas** application in data analysis. Deployed on **binder.org** for running **Jupyter notebook** live.*
- Web Scraping: Mission To Mars *2018* (link) (*Demo*)
  ***Web scraping** for real time news about Mars. **requests, Beautiful Soup, Selenium, PyMongo, flask** are used. Deployed on **Heroku**.*
- *Belly button biodiversity* *2018* (link) (*Demo*)
  ***Dashboard** for plotting belly button biodiversity. **Plotly.js**, **d3.js, sqlalchemy, flask,** are used. Deployed in **Heroku**.*

2. Modelling & Simulation in theoretical condensed matter physics

- Scattering Wave function approach to the quantum transport in mesoscopic system 2005 (link)
  - Role: ***Independent contributor***
  - Key technique: ***Complex Linear Algebra; Wave component analysis; Boundary Conditions;***
  - Achievements: ***A new scattering wave function approach** was constructed to study the quantum transport phenomena in **arbitrary lattice model** for mesoscopic systems. Such method is **more efficient algorithmically** and was later adopted by one of today's most popular simulation tools for quantum transport, i.e., Python Package Kwant. Our earlier systematic paper on this method can be found here(2006).*
- Boundary-confinement-induced spin-orbit coupling 2006 (pdf)
  - Role: *First Author and **Major executive**; Responsible for **MATLAB simulation** and **Data Analysis***
  - Key technique: ***MATLAB simulation**, **Data Analysis**, Symmetry Analysis*
  - Achievements: ***A new model** for spin-orbital coupling in semiconductor electron gas is proposed. **MATLAB simulation** of quantum transport for this model is performed. Some new spin-hall-alike effect is **predicted** for the model. Cited 48 times.*
- Andreev conductivity of graphene with d+id' superconducting pairing 2008 (pdf)
  - Role: *First Author and **Major executive**; Responsible for **Fortran simulation** and **Data Analysis***
  - Key technique: ***Fortran Programming**, **Data Analysis**, Symmetry Analysis*
  - Achievements: *A special superconducting state for graphene was **analyzed** and some **intriguing correlation** with other states was **found**. Through **numerical simulation** with **Fortran programming language**, we **predicted** some observable effects that can be proved or falsified by experiment, Cited 52 times.*
- Generation of pure bulk valley current in graphene 2013 (pdf)
  - Role: *First and Corresponding Author; **Project Leader; MATLAB simulation** and **Data Analysis***
  - Key technique: ***MATLAB simulation**, **Data Analysis, Symmetry Analysis***
  - Achievements: *Based on **symmetry analysis** of the suspended graphene, **a novel effect** that can lead to a state with pure valley current was theoretically **predicted**. Using **MATLAB simulation**, such effect was quantitatively characterized. A pure 4-probe experimental setup was proposed to detect such a state. Published in the prestigious Journal "Physical Review Letters", Cited 141 times.*
- Hofstadter-Butterfly of Twisted Graphene Bilayer 2018 (link)
  - Role: ***Independent contributor***
  - Key technique: ***Python Programming**, **Data Analysis***
  - *Using the Python Package Kwant, set up and **visualize** the superlattice of Twisted Graphene Bilayer(TGB). Use **Python simulation** to calculate the Landau levels(also named **Hofstadter-Butterfly**) of TGB.*

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Awards &Responsibility

- Award for Distinguished publication during the 2005-2010 period in ZheJiang Province, P.R.China, 2012
- Academic leadership for young and middle-aged scientists in ZheJiang province, P.R.China, 2013
- Referee for *Physical Review Letters*, *Physical Review B* and several other Physics Journals.

Job expectation

Researcher or/and Engineer of Machine Learning/Deep Learning, Full stack web developer