

Yongjin Jiang

Email: yjjiangphysics@gmail.com
Portfolio: <https://yongjinjiang.github.io/portfolio/>

Mobile Phone: +1(612)-442-4832

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. Extensive research experience in quantum modeling and numerical simulation of nano-structured materials. A creative, critical thinker with a strong eagerness for learning and employing advanced skills to maximize scalability and drive feasible results. Proven ability in performing data visualization & analytics using Python/R, JavaScript, Machine Learning, and more.

Education/Certificates

- Data Visualization and analytics Bootcamp, 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, Big Data and Machine Learning.
- Deep Learning Specialization, 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

Experience

- Data Visualization and analytics Bootcamp, University of Minnesota 2018.8-2019.2
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Skills

- *Databases:* MySQL, MongoDB, SQLite
- *Programming:* Python, JavaScript, Excel/VBA, R, Tableau, MATLAB, Mathematica, Fortran
- *Machine Learning:* Regression, knn, decision tree, Random forest, support-vector machine (SVM), Convolutional Neural Network (CNN), Recurrent Neural Network (RNN), Scikit-learn, TensorFlow, Keras
- *Mathematics and Statistics:* Calculus, Linear Algebra, Complex Function Analysis, Partial Differential Equations, Group Theory, Numerical Optimization, Numerical Linear Algebra, Statistical Mechanics, Green's function, Kernel Methods, Monte Carlo simulation
- *Theoretical Physics:* Quantum transport theory, Spin hall effect, Superconductivity, Topological Band theory
- *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. Features for both x and y axis are selectable. **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 application of **Python pandas** to do data analysis. Deployed on **binder.org** for running **Jupyter notebook**.*

- Web Scraping: Mission To Mars 2018 ([link](#)) ([Demo](#))
*Web scraping for real time news about Mars: Python packages like **requests**, **BeautifulSoup**, **selenium**, **pymongo**, **flask** are used. Deployed on **Heroku** (note for demo: refresh the /scrape page for a few times if somehow it stopped working).*
 - Belly button biodiversity 2018 ([link](#)) ([Demo](#))
*Dashboard for plotting belly button biodiversity. **Plotly.js** and **d3.js** are used to make the visualizations. 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 Author*
 - Key technique: *Complex Linear Algebra; Wave component analysis; Boundary Conditions;*
 - Achievements: *A **new scattering wave function approach** was presented for the first time to study the quantum transport phenomena in **arbitrary lattice model** for mesoscopic systems. Such method is **more efficient algorithmically** and was later adopted by today's most popular simulation tool 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; Responsible for **MATLAB simulation** and **Data Analysis***
 - Key technique: ***MATLAB simulation**, **Data 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 spin-hall-alike effect is **predicted** in the model. [Cited](#) 51 times.*
 - Andreev conductivity of graphene with d+id' superconducting pairing 2008 ([pdf](#))
 - Role: *First Author; **Major executive** ; Responsible for **Fortran simulation** and **Data Analysis***
 - Key technique: ***Fortran Programming**, **Data 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. Our work is being cited continually during the past years including several times by "Review of Modern Physics", the most prestigious review journal in the physics community. [Cited](#) 50 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: ***Fortran Programming**, **Data 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](#) 135 times.*
 - Magnetoelectronic properties of multilayer black phosphorus 2015 ([pdf](#))
 - Role: *First Author; **Major executive** ; Responsible for **Fortran simulation** and **Data Analysis***
 - Key technique: ***Fortran Programming**, **Data Analysis***
 - Achievements: *Based on a **phenomenological model** (proposed by us on a previous paper) for multilayer black phosphorus thin films, we used **MATLAB simulation** to calculate its ac conductivity under magnetic field. A **distinct structure was revealed** for its Landau energy levels, which is different from that of usual semiconductor electron gas as well as graphene. [Cited](#) 28 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 of the lattice model for TGB, which is also named **Hofstadter-Butterfly** of TGB.*

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

Data Scientist, Researcher or/and Engineer of Machine Learning and Deep Learning (e.g., Machine Translation, Natural Language Processing, Computer visualization).