LUYAN YU

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EDUCATION

University of Texas at Austin *Aug. 2017 – Present*
Physics Ph.D. Program (in Progress)
Overall GPA: 4.00/4.00

Nanjing University *Sep. 2013 – Jul. 2017*
B.S. in Physics
Major GPA: 4.71/5.00 Overall GPA: 4.62/5.00 Ranking: 2/93

EXPERIENCE

Probabilistic Model of Spiking Neural Network Oct. 2018 – Present
Graduate Research with Professor Thibaud Taillefumier *Austin, TX, USA*

- Investigate spiking neural network with replica mean field approximation.
- Develop fast numerical algorithm to calculate mean spiking rate of neural network.

Tropical Geometry of Phylogenetic Trees Feb. 2019 – Present
Course Project with with Professor Ngoc Tran Mai *Austin, TX, USA*

- Study the extremality of phylogenetic trees as vertices of tropical polytope.

UCLA Cross-disciplinary Scholars in Science and Technology Jul. 2016 – Sep. 2016
Summer Research Internship with Professor Kang L. Wang *Los Angeles, CA, USA*

- Discovered a non-trivial topological phase transition process in anti-ferromagnetic and topological insulator trilayer structure and numerically recreate the behavior using non-equilibrium Green's function method (see publication).
- Developed symbolic calculation package of tight binding model and implemented recursive Green's function method for acceleration.

Undergraduate Research in Quantum Information Jan. 2015 – Jul. 2017
Research Guided by Professor Shengjun Wu *Nanjing, China*

- Studied the localization in quantum walk and implemented simulation program.
- Proved a key theorem related to generalized Riemann-Lebesgue lemma using tools from real analysis.
- Implemented quantum walk simulation package in Mathematica.

Mathematical Contest in Modeling Feb. 2015

- Modelled and programmed for the Ebola disease spreading, curation efficiency and drug delivery system using the cellular automata model.

PUBLICATIONS

Journals

- He, Q. L., Yin, G., Yu, L., Grutter, A. J., Pan, L., Kou, X., ... & Shao, Q. (2018). Topological transitions induced by antiferromagnetism in a thin-film topological insulator. Physics Review Letter, 121(9), 096802.
- Lyu, C., Yu, L., & Wu, S. (2015). Localization in quantum walks on a honeycomb network. Physical Review A, 92(5), 052305.

Book Chapters

- Yu, L., Zhou, Z., Zhu, Z., Gao, W., & Wang, S. (2016). 2014 Problem 12: Cold Balloon. International Young Physicists' Tournament: Problems & Solutions 2014, 113.
- Zhao, W., Yu, L., Chen, L., Wang, S., & Zhou, H. (2016). 2014 Problem 15: Oil Stars. International Young Physicists' Tournament: Problems & Solutions 2014, 133.
- Fan, W., Yu, L., Wang, S., & Gao, W. (2016). 2014 Problem 3: Twisted Rope. International Young Physicists' Tournament: Problems & Solutions 2014, 29.

HONORS

Awards

- Meritorious Winner — 2015, Mathematical Contest in Modeling, USA
- Bronze Medal Winner — 2014, University Physics Competition, USA
- First Award Winner — 2014, Taiwan College Physicists' Tournament, Taiwan, China
- Elite Program Member — 2013, Nanjing University, China

Scholarships

- Provost's Graduate Excellence Fellowship — 2017, University of Texas at Austin, Texas, USA
- UCLA - CSST Scholarship — 2016, University of California, Los Angeles, USA
- Bao Steel Education Scholarship, 5 in Nanjing University — 2016, Bao Steel Education, China
- National Scholarship, for top 0.2% in China — 2014, Ministry of Education, China
- Elite Scholarship, for top 1% in department — 2014–2016, Nanjing University, China

COURSES (SELECTED)

Physics

- Quantum Field Theory, Solid State Physics, Many Body Theory
- Computational Physics, Quantum Information Science
- Optics, Particle Physics, Nuclear Physics, Astronomy, Electronic Circuits
- Quantum Mechanics, Electromagnetic Theory, Statistical Mechanics, Classical Mechanics

Mathematics

- Mathematical Neuroscience, Tropical Mathematics, Stochastic Process, Numerical Analysis
- Mathematical methods for physics, Modern Applied Mathematics, Differentiable Manifold and Lie Groups
- Calculus, Linear Algebra, Probability Theory and Mathematical Statistics

Others

- Geometry in Data Science
- Neural Networks and Deep Learning (by deeplearning.ai on Coursera)
- Machine Learning (by Stanford University on Coursera)

TECHNICAL STRENGTHS

Computer Languages C++, Python, Mathematica, Matlab, Javascript
Writing Tools LaTeX