

Wenshuo Liu

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Information 848-565-5876 *wsliu@umich.edu*

Education **Rutgers University**, New Brunswick, New Jersey, USA

PhD in Theoretical Physics

2014

- Dissertation Topic: Quench Dynamics of Quantum Integrable Models through an Exact Solution

Peking University, Beijing, China

B.S. in Physics

2007

Experience **Michigan Integrated Center for Health Analytics & Medical Prediction (MiCHAMP)**, Ann Arbor, MI

Postdoctoral Research Associate, Advisor: Brahmajee Nallamothu and Ji Zhu 09/2017-present

- Built automated endoscopic grading system based on deep convolutional neural networks
- Developing new deep learning algorithms to predict 30-day unplanned hospital readmissions

Survey Research Center, University of Michigan Institute for Social Research, Ann Arbor, MI

Research Investigator

09/2017-present

- Developing methods on multiple imputation of longitudinal data originated from the Panel Study of Income Dynamics

Department of Biostatistics & Medical Informatics, University of Wisconsin-Madison, Madison, WI

Postdoctoral Research Associate, Advisor: Menggang Yu

09/2015-08/2017

- Developed methodology based on group fused Lasso for cancer staging in meta-analysis with individual participant survival data, and developed the software in R and C++
- Conducted comparative effectiveness research using Bayesian Additive Regression Trees for Accountable Care Organization programs, in collaboration with health services researchers

Department of Physics, University of Wisconsin-Madison, Madison, WI

Postdoctoral Research Associate, Advisor: Maxim Vavilov

09/2014-09/2015

- Developed a method based on stochastic calculus to calculate the noise characteristics of superconducting circuits

Department of Physics & Astronomy, Rutgers University, Piscataway, NJ

Research Assistant, Advisor: Natan Andrei

09/2009-09/2014

- Developed an original analytical approach to solve the time evolution of the quantum spin chain
- Computed time-dependent probability distribution of the Anisotropic Heisenberg Model by both stationary phase approximation and numerical integration through C++

Department of Mathematics, Rutgers University, Piscataway, NJ

Research Assistant, Advisor: Joel Lebowitz

09/2013-09/2014

- Established the mathematical equivalence between the 1-D classical stochastic model and the quantum spin chain
- Developed the integral representation of dynamics of the Simple Exclusion Process

Department of Physics & Astronomy, Rutgers University, Piscataway, NJ

Teaching Assistant

09/2008-12/2013

- Led the discussion in problem solving classes and Analytical Physics Lab of up to 20 undergraduate students

Publications

- **Wenshuo Liu**, Ryan Stidham, Ji Zhu, Akbar Awaljee and Brahmajee Nallamothe, “Endoscopic Grading of Ulcerative Colitis by Deep Convolutional Neural Networks”. In preparation.
- **Wenshuo Liu**, Tianjie Wang and Menggang Yu, “Cancer Staging in Meta-analysis by Group Fused Lasso”. To be submitted, manuscript upon request.
- **Wenshuo Liu** and Natan Andrei, “Non-equilibrium Magnetism in One Dimension.” To be submitted to *Phys. Rev. B*.
- **Wenshuo Liu** and Natan Andrei, “Quench Dynamics of the Anisotropic Heisenberg Model.” *Phys. Rev. Lett.* **112**, 257204 (2014).
- **Wenshuo Liu**, et al. “Study on the Dispersion of Charged Single-Wall Carbon Nanotube Bundles by First Principles Calculation.” *J. of Nanosci. Nanotechnol.* **9**, 5170-5172 (2009).

Presentations

- “Noise characteristics of Superconducting Low-Inductance Undulatory Galvanometer”, *APS March Meeting, San Antonio, TX, March 2015*
- “Quench Dynamics of the Anisotropic Heisenberg Model”, *APS March Meeting, Denver, CO, March 2014*
- “Quench Dynamics of the Anisotropic Heisenberg Model and Propagation of Bounded Magnons”, *110th Statistical Mechanics Conference, Piscataway, NJ, Dec 2013*
- “Quenching Dynamics of the Anisotropic Heisenberg Model through a Critical Point”, *APS March Meeting, Baltimore, MD, March 2013*
- “Study of the Kondo Effect in a Generalized Anderson Impurity Model by Exact Solution Approach”, *Mount Holyoke College, South Hadley, MA, June 2012*

Technical Skills

Programming: Python (with popular libraries in machine learning such as keras, tensorflow and pandas), R, C++ (with numerical libraries such as Eigen), Matlab, Mathematica

Mathematics: Statistical modeling, partial differential equations, stochastic calculus

Algorithm: Deep learning, convex optimization, numerical integration, Markov Chain Monte Carlo

Application: Operating systems: Unix/Linux, Windows, Text edit: L^AT_EX, Microsoft Office

Other

Self-Learning

- Completed the course “Machine Learning” by Andrew Ng on Courera.org