Parsa Rangriz

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Education

- **Sharif University of Technology, Tehran, Iran** GPA: 18.55/20 - Transcript
  B.Sc. in Physics - Minor B.Sc. in Mathematics *Sep 2018 - Dec 2022*

  Selected Courses: *Quantum Information, Quantum Computation, Open Quantum Systems, Machine Learning in Physics, Statistical Mechanics III, Quantum Mechanics III, Electromagnetism III, Complex Systems, Entropy Maximization and Variational Optimization, Advanced Statistics, Information Theoretic Methods in High-Dimensional Probability*

Research Interests

Probability, Statistical Physics, Spin Glasses, Random Matrices, Graphical Models, Optimization

Research Experiences

- **EPFL** Lausanne, Switzerland
  Summer Intern, SPOC Laboratory - ***Prof. Lenka Zdeborová*** *July 2022 - Sep 2022*
  - **Assortative Partitions of Fully Connected Graphs**: By using spin glasses theory (replica symmetry and symmetry breaking), we study dense graphs to study single-spin-flip-stable states in spin glasses and their phase transitions.
- **Sharif University of Technology** Tehran, Iran
  Research Assistant - ***Prof. Amir Daneshgar*** *Oct 2021 - June 2022*
  - **Properties of a New Regular Random Graph Generator**: With the help of the message-passing algorithm, combinatorial properties of a newly developed method of constructing regular random graphs are studied to see what the differences are between the generated graphs and other methods.
- **The University of Manchester** Manchester, England
  Remote Intern, Noisy Quantum Systems Group - ***Dr. Ahsan Nazir*** *Jul 2021 - Mar 2022*
  - **Non-Conjugate Quantum Subsystems**: Investigated quantum interactions and the measurement process in the quantum regime, especially for incompatible observables by introducing the notion of nonconjugate quantum subsystems, and studying the thermodynamics of quantum subsystems with respect to coarse-grained (observational) entropy.

TA Experiences

- **Statistical Mechanics III:** Prof. Shahin Rouhani (‘22), Prof. Vahid Karimipour (‘21), Prof. Ali Rezakhani (‘21)
- **Statistical Mechanics II:** Prof. Vahid Karimipour (‘21)
- **Statistical Mechanics I:** Prof. Vahid Karimipour (‘20)
- **General Physics III:** Prof. Omid Akhavan (‘19)
- **Fundamentals of C Programming:** Dr. Marjan Nikbin (‘18)

Honors and Awards

- Awarded the **Summer@EPFL 2022 Fellowship** (Summer 2022)
- Ranked 5th in the **26th Iran Universities Physics Olympiad**, Sanjesh Organization, Iran. (Summer 2021)
- Silver Medal in the **30th Iran National Physics Olympiad**, Young Scholars’ Club, Iran. (Summer 2017)
- Awarded Scholarship from **Iran’s National Elites Foundation**. (2018 - Current)

Computer Skills

- **Languages**: C, C++, Python, Wolfram Mathematica, LaTeX
- **Data Tools**: Keras, Sci-Kit Learn

Attended Schools

- **ETH Zurich** Zurich, Switzerland
  Quantum Thermodynamics Summer School 2021 - Certificate *Aug 2021*
- **University of Sao Paulo** Sao Paulo, Brazil
  Mini-Course in Quantum Thermodynamics 2020 - Certificate *Dec 2020*

Course Projects

- **Variational Inference in LDPC Codes** — Report PDF
  Course : Information Theoretic Methods in High-Dimensional Probability — *Fall 2021*
- **Belief Propagation for Graph Partitioning** — Report PDF
  Course : Entropy Maximization and Variational Optimization — *Spring 2021*
- **Phase Transition of the Transverse-Field Ising Model** — Report PDF
  Course : Machine Learning in Physics — *Spring 2021*
- **An Introduction to Quantum Thermodynamics**
  Course : Quantum Mechanics III — *Fall 2020*

Academic References

- **Prof. Lenka Zdeborová**
  Statistical Physics of Computation Laboratory, Department of Physics, EPFL, Switzerland
- **Prof. Amir Daneshgar**
  Department of Mathematical Sciences, Sharif University of Technology, Iran
- **Dr. Ahsan Nazir**
  Theoretical Physics Group, Department of Physics & Astronomy, The University of Manchester, England