

# Shouvanik Chakrabarti

*Ph.D. Student*

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## Research Interests

Quantum Algorithms, Quantum Information, Theory of Computation, Theoretical Machine Learning, Deep Learning

## Education

- 08/2017–present **Ph.D. in Computer Science**, *University of Maryland*, College Park, Maryland, GPA : 4.0.  
**Advisor:** Prof. Xiaodi Wu
- 08/2017–05/2019 **M.S. in Computer Science**, *University of Maryland*, College Park, Maryland, GPA : 4.0.
- 07/2013–05/2017 **B.Tech. (Honors) in Computer Science and Engineering, Minor in Physics**, *Indian Institute of Technology*, Bombay, India, GPA – 9.05/10.

## Awards

- 2017-18 Dean's Fellowship at the University of Maryland, College Park
- 2013 Silver Medal at the 44<sup>th</sup> International Physics Olympiad, Copenhagen, Denmark
- 2013 Gold Medal at the Indian National Physics Olympiad
- 2013 Gold Medal at the Indian National Astrophysics Olympiad
- 2012 Awarded KVPY scholarship by the Indian Institute of Science
- 2010 Gold Medal at the Indian National Astronomy Olympiad
- 2010 Gold Medal at the Indian National Junior Science Olympiad

## Publications

### Journals

- **Shouvanik Chakrabarti**, Andrew M. Childs, Tongyang Li, and Xiaodi Wu, *Quantum algorithms and lower bounds for convex optimization*, To appear in Quantum. Also available at arXiv: 1809.01731.

### Peer-reviewed Conferences with Proceedings

- (\* indicates equal contribution) **Shouvanik Chakrabarti\***, Yiming Huang\*, Tongyang Li, Soheil Feizi, and Xiaodi Wu, *Quantum Wasserstein Generative Adversarial Networks*, In the proceedings of the 32nd Annual Conference on Neural Information Processing Systems (NeurIPS 2019). Also available at arXiv:1911.00111.
- Tongyang Li, **Shouvanik Chakrabarti** and Xiaodi Wu, *Quantum algorithms for training linear and kernelized classifiers*. In the proceedings of the 36th International Conference on Machine Learning (ICML 2019). Also available at arXiv:1904.02276.

## Peer-reviewed Conferences without Proceedings

- **Shouvanik Chakrabarti**, Andrew M. Childs, Tongyang Li, and Xiaodi Wu, *Quantum algorithms and lower bounds for convex optimization*, at the 22nd Conference on Quantum Information Processing (QIP 2019). Also available at arXiv: 1809.01731.
- **Shouvanik Chakrabarti**, Andrew Childs, Shih-han Hung, Tongyang Li, Chunhao Wang and Xiaodi Wu, *Quantum algorithm for estimating volumes of convex bodies*, at the 23rd Conference on Quantum Information Processing, 2019. Also available at arXiv: 1908.03903.

## Manuscripts

- Shaopeng Zhu, Shih-han Hung, **Shouvanik Chakrabarti**, and Xiaodi Wu, *On the principles of differential quantum programming languages*, manuscript, 2019.

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## Experience

### Vocational

- 05/2016– **Summer Research Intern**, XEROX RESEARCH CENTER INDIA, Bangalore, India.  
07/2016 Development of routing algorithms, specifically involving the prize collecting Traveling Salesman Problem on restricted metric spaces.  
**Advisor:** Dr. Koyel Mukherjee, Senior Research Scientist
- 04/2015– **Summer Intern**, EVOLGENCE TELECOM SYSTEMS PVT. LTD., Hyderabad, India.  
07/2015 Development of proprietary modules for an open-source SIP server, Kamailio. Added group and offline messaging features for SIP messages.  
**Advisor:** Manmohan GK, Chief Technical Officer

### Teaching

- Fall 2018 **Teaching Assistant**, CMSC657, Quantum Information and Computation, University of Maryland.  
Held office hours, participated in grading, delivered stand-in lectures, participated in creation of lecture notes.
- Spring 2018 **Teaching Assistant**, CMSC457, Quantum Information and Computation, University of Maryland.  
Held office hours, participated in grading, delivered stand-in lectures.
- Fall 2017 **Teaching Assistant**, CMSC250, Discrete Structures, University of Maryland.  
Led discussion section, participated in grading.
- Spring 2017 **Teaching Assistant**, CS218, Computer Networks, Indian Institute of Technology Bombay.  
Held office hours, participated in grading.
- Fall 2016 **Teaching Assistant**, CS251, Software Systems Lab, Indian Institute of Technology Bombay.  
Designed assignments, held office hours. Received departmental best TA award.
- Spring 2015 **Teaching Assistant**, PH108, Introduction to Electromagnetism, Indian Institute of Technology Bombay.  
Led discussion section, participated in grading.

Fall 2014 **Teaching Assistant**, PH107, Quantum Mechanics, Indian Institute of Technology Bombay.  
Led discussion section, participated in grading.

## Technical skills

- **General Purpose Programming Languages:** (Advanced) C/C++, Python (Basic) JAVA, Prolog, Matlab, Ruby, Haskell, Common Lisp, Emacs Lisp, Javascript
- **Libraries for Machine Learning:** tensorflow, keras, pytorch
- **Quantum Simulation Libraries:** qiskit, cirq, pennylane
- **Miscellaneous:**  $\text{\LaTeX}$ , HTML/CSS, Coq