Vinay Tripathi

CONTACT

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EDUCATION

University of Southern California, Los Angeles, CA   August 2019 – Present
Ph.D. student, Physics   (CGPA 3.94/4)

University of California, Riverside, CA   September 2017 – July 2019
Master of Science, Electrical Engineering   (GPA 3.96/4)

Indian Institute of Technology Delhi, New Delhi, India   July 2014 – May 2016
Masters of Science (M.Sc.) Physics   (GPA 8/10)

Hansraj College, University of Delhi, Delhi, India   July 2011 – june 2014
B.Sc. (Hons.) Physics   (GPA 89 %)

CURRENT
POSITION

University of Southern California, Research Assistant, Daniel Lidar group   August 2019 -Present
Ongoing projects:
- Modeling of open quantum system effects on transmon qubits.
- Modeling and analysis of couplers for superconducting two-qubit parametric gates.
- Theoretical analysis of higher order dynamical decoupling sequences
- Surface code analysis with *detailed noise*

RESEARCH
EXPERIENCE

IBM Quantum, Summer research intern   June 2020 -August 2020
Mentor: Dr. Abhinav Kandala
Project: *Exploring the large drive limit of cross-resonance (CR) gate using Floquet approach*
- Developed a numerical toolkit based on Floquet theory to study CR gate in the large drive limit.
- The model introduced a systematic way to study CR gate without making any rotating wave approximation (RWA)

UC Riverside, Research Assistant, QCAMP lab, ECE department   Sept 2017 -July 2019
Advisor: Prof. Alexander Korotkov
Project: *Operation and error budget of Cross-Resonance (CR) gate*
- Numerically studied the working of CR gate for two-qubit transmon systems
- Explored the sources of error in the gate and their dependence on various parameters

New York University, Shanghai, Research Assistant, Tim Byrnes Lab   (Jun 2016 - Dec 2016)
Advisor: Prof. Tim Byrnes
Project: *Entanglement criterion for bipartite spin systems*
- Generalized covariance matrix approach for entanglement detection in bipartite systems
- Applied the theory to detect entanglement in entanlged spin ensembles, BECs etc.

IIT Delhi, M.Sc. Thesis   July 2015 –May, 2016
Thesis Supervisor: Prof. V. Ravishankar
Thesis Title: *Wigner Distribution function for spin systems*
- Formulated general definition of WDF for any spin (integral and half integral) was constructed.
- Discrete version of Coherent state and Cat state WDF were calculated.

PUBLICATIONS

4. **Modeling low- and high-frequency noise in transmon qubits with resource-efficient measurement**
   V. Tripathi, H. Chen, E. M. Levenson-Falk, D. A. Lidar
   arXiv: 2303.00095 (2023)

3. **Suppression of crosstalk in superconducting qubits using dynamical decoupling**
   [Editors' suggestion]
   V. Tripathi, H. Chen, M. Khezri, K. Yip, E. M. Levenson-Falk, D. A. Lidar
   Phys. Rev. Applied 18, 024068 (2022)

2. **Covariance matrix entanglement criterion for an arbitrary set of operators**
   V. Tripathi, C. Radhakrishnan, T. Byrnes
   New Journal of Physics 22 (7), 073055 (2020)

1. **Operation and error budget of cross-resonance gate** [Editors' suggestion]
   V. Tripathi, M. Khezri, A.N. Korotkov
   Phys. Rev. A 100, 012301 (2019)

FELLOWSHIPS

- Dean's Distinguished Fellowship, University of California Riverside (2017-2018)
- Indian Academy of Science Fellowship for summer research (May 2015–July 2015).

CONFERENCES & TALKS

7. **Suppression of crosstalk in transmon qubits using dynamical decoupling**
   Conference talk: American Physical Society (APS) March Meeting
   Chicago, IL, March 2022

6. **Cross-resonance (CR) Gate : basics and recent developments**
   Invited talk: Weekly seminar, Google quantum AI
   Online, January 11, 2022

5. **Suppression of crosstalk in transmon qubits using dynamical decoupling**
   Invited talk: Rigetti computing
   Online, September 2021

4. **Modeling and suppression of noise in transmons: theory and experiment**
   Conference talk: American Physical Society (APS) March Meeting
   Online, March 2021

3. **Suppressing noise on superconducting qubits using dynamical decoupling**
   Conference talk: American Physical Society (APS) March Meeting
   Denver, CO, March 2020

2. **Operation and error budget of Cross-Resonance gate**
   Conference talk: American Physical Society (APS) March Meeting
   Boston, MA, March 2019

1. **Wigner distribution function for spin systems**
   Poster Presentation : 4th International Conference on Quantum Foundations (ICQFT 2016)
   Shanghai, China, 2016

COMPUTER SKILLS   Python, Julia, Mathematica, MATLAB, LaTeX