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Mansi Tarani

Undergraduate Researcher

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Tarani

Impact: Three years of exposure to pure/applied physics along with experimental analysis in cognitive sciences has led me to develop a keen interest in interdisciplinary research

Research Interests Include: Quantum physics, Quantum computing, Applied physics, Cognitive Science, Computer Science

EDUCATION

Bachelor of Science, Physics honors, Dayalbagh University, Agra, GPA: 8.51/10.00 Jun 2019 — May 2022

NON FORMAL EDUCATION

Qiskit Global Summer School 2022, IBM July 2022 — July 2022

- Developed understanding about quantum chemistry
- Applied quantum computing and its application to quantum simulations

Qiskit Global Summer School 2021, IBM July 2021 — July 2021

- Studied concepts of Classical Machine Learning and linked them to Quantum Computing
- Developed fundamental knowledge of Quantum Machine Learning and applied quantum algorithms in hands-on laboratory session

Qiskit Global Summer School 2020, IBM Jun 2020 — Jun 2020

- Introduced to the world of Quantum Computing, explored and implemented Quantum algorithm in laboratory session.
- Completed a project on V.Q.E model

Introduction to Quantum Computing Course, Qubit by Qubit October 2020 — May 2021

- Strengthened concepts of Quantum Computing, explored possible applications and completed all homework
- Passed this course with 98 percent

PROJECTS

Project Lead, Cognitive Science Lab, Dayalbagh Educational Institute, India May 2022— July 2022

- Quantum Zeno Effect in bistable perception, along with physical and mathematical interpretations.
- Attempted to prove the role of quantum mechanics in dynamics of mental states.

Project Lead, Cognitive Science Lab, Dayalbagh Educational Institute, India Oct 2021 — Mar 2022

- Identifying Correlation Dimensions of non linear time series using E/MEG data
- Created mathematical model for quantifying state of mind
- Compared difference in correlation dimension in advance, moderate and newbie mediators

Lead Experimenter, Cognitive Science Lab, Dayalbagh Educational Institute, India Sept 2020 — Mar 2021

- Insight in mathematics problem such as number reduction task
- Recorded electroencephalography (EEG) data of various participants solving NRT problems
- Identifying gamma burst and calculating correlation dimension

Project executive, Qiskit Challenge India hackathon Sept 2020 — Sept 2020

- Wrote a program to tell the difference between number 4 and number 9 using quantum machine learning
- Developed the ability to apply and experiment with classical machine learning techniques and Variational Quantum Classifier (VQC) algorithm.

Project manager, Qiskit global summer school challenge July 2020 — July 2020

- Simulated VQE algorithm for calculating ground state energy of LiH molecule

Project Lead, Assisi Convent School Etah, India June 2018— Aug 2018

- Travel management interface system using C++.

EXPERIENCE

Researcher, Cognitive Science Lab, Dayalbagh Educational Institute, India Sept 2020 — July 2022

- Analysed linear and non-linear time series data and interpreted its result
- Responsible for subject recruitment, designing, implementation, data analysis and documentation

Student, Electronics Work Experience, Dayalbagh Educational Institute, India July 2019 — Dec 2019

- Hand-on experience of electronics components and circuits
- Analysed circuits and recreated some practical applications

SKILLS

Data analysis	Signal Processing, Time series analysis
Software	Brainstorm, ePrime
Programming	C++, SQL, Matlab, HTML
Leadership	Mentor to freshmen
Volunteer	National Service Scheme

AWARDS & HONORS

Research	Undergraduate Research Award, 2021 (STEM research); Paper presentation momento, 2022 (UGC-SAP Committee, DEI); Research paper publication in conference proceedings, 2021 (National Systems Conference);
National	Selected for science camp under INSPIRE internship program (Department of Science and technology (DST))