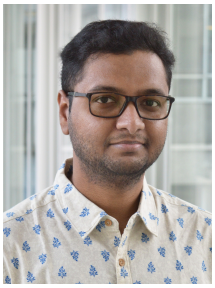
Aritra Sarkar

mr.aritra.sarkar@gmail.com • a.sarkar-3@tudelft.nl • (+31)-649562460



Objective

Innovative, optimistic and dedicated professional interested in research collaborations

Keywords: quantum algorithms; artificial intelligence; computer architecture; genomics; spacecraft engineering; embedded programming; system design; computability theory

Education

Delft University of Technology — Delft, The Netherlands

PhD candidate at Quantum Computer Architecture Lab — *Nov '18 – (Nov '22)*

QuTech (faculty of AS)
Quantum & Computer Engineering Group (faculty of EEMCS)
Topic: Accelerating genomics using quantum machine learning algorithms

Master of Science in Computer Engineering, cum laude — *Sep '16 – Jun '18*

Specialisation in Quantum Computing Architecture

Indian Institute of Space Science and Technology — Thiruvananthapuram, India

Bachelor of Technology in Avionics — *Aug '09 – May '13*

Specialisation in Computer Science and Space Robotics

Experience

TCS Research and Innovation — Kolkata, India

Research Intern (Ph.D.) at Embedded Systems and Robotics group — *Aug '18 – Sep '18*

- Spiking neural network based associative memory evolution for context-based navigation

Research Intern (M.Sc.) at Embedded Systems and Robotics group — *Jul '17 – Oct '17*

- Brain-inspired robotic mapping and navigation using time-series of hexagonal grid and place cells
- System design of warehouse automation using multi-agent collaborative box-pushing strategies

ISRO Satellite Centre, Department of Space, Government of India — Bangalore, India

Scientist — *Oct '13 – Jul '16*

Major responsibilities as part of Controls and Digital Systems area:

- *Project Manager* for HySIS (hyperspectral imaging satellite) Solid State Recorder (SSR) sub-system
- *Team Leader* for standardisation of SSR firmware design for remote-sensing and scientific satellites
- *Lead Software Designer* of SSR for AstroSat (space observatory), ResourceSat (resource mapping), CartoSat (cartography and military surveillance), ScatSat (oceanography) and MicroSat series of satellites and Chandrayaan-2 (lunar orbiter-lander-rover)
- *Member* of Circuit Review Committee and FPGA Design Review Committee

Academic Projects

- Quantum algorithms for pattern-matching in genomic sequences (master's thesis)
- Quantum Innovation Environment (QuInE), a PyQT based IDE for quantum programming
- Human brain simulation in GPU with Inferior Olive model in OpenCL and CUDA
- GATK based human genome sequencing for distributed Spark platform in Scala
- Fuzzing and concolic execution on RERS-2016 problems using AFL and KLEE
- Optimizing a SoC using ρ-VEX VLIW processors
- Enhancing the Plasma processor IP core
- Accelerating object tracking in OMAP3530 application processor
- Solar energy forecasting using ORCA system
- Earthquake occurrence analysis and aftershock prediction using MATLAB and Tableau
- Elevation mapping using stereo vision enabled heterogeneous multi-agent network (bachelor's thesis)
- Computer vision based centralized multi-agent system on MATLAB and Arduino
- Self-configuring classical logic gate circuits using genetic programming in Java
- Multi-vehicle path planning in dynamically changing environments using genetic optimised TSP

Certifications

- **Stanford Online:** Introduction to Artificial Intelligence (Dec '11), Machine Learning (Dec '11)
- **Coursera:** Quantum Mechanics and Quantum Computation (Dec '12)
- **Udacity:** Artificial Intelligence for Robotics (Apr '14)
- **edX:** The Quantum Internet and Quantum Computers (May '18) , Introduction to Genomic Data Science (Nov '18)
- **Big Data University:** Hadoop 101, MapReduce and YARN, Apache Pig 101, Watson Analytics 101, Big Data 101, R 101, Bitcoin 101
- **IBM Cognitive Class:** Build Your Own Chatbot

Skills

Programming: MATLAB , Assembly , Python , C++ , Java , OpenQL , QASM , C , ADA , VHDL , OpenCL , CUDA

Hardware: Intel 8086 , Actel 54SX32 FPGA , Raspberry Pi , Arduino , AVR Atmel

Software: MS Office, Git, Linux, LaTeX, ROS, Tableau, PyQt, Libero IDE, Eclipse, Sublime Text, VS Code, ModelSim, AFL, KLEE, MS Visual Studio, Camtasia, Virtual Box, Android Studio

Languages: English *(professional proficiency)*, Bengali *(mother tongue)* , Hindi *(native proficiency)*

Publications

- Aritra Sarkar, Srividhya R., Jothy Soman, Subramanya Udupa, "*Approaches towards standardization of software for on-board storage systems in space programs*," Proceedings of Enabling Spacecraft Systems Realization through Industries Conference, ESSRI-16, June 2016.
- Aritra Sarkar, Jafi E.J., Srividhya R., Jothy Soman, Subramanya Udupa and Valarmathi N., "*On-board payload data store and forward design for remote sensing satellites*," Proceedings of National Conference on Recent Trends in Microsystems, IINC-15, October 2015.
- S. Srivastava, A. Sarkar, and B. S. Manoj, "*Hazard Control Algorithms for Heterogenous Multi-Agent Cloud-Enabled Robotic Network*," Proceedings of IEEE ANTS 2013, December 2013.
- A. Sarkar, S. Srivastava, and B. S. Manoj, "*Elevation Mapping Using Stereo Vision Enabled Heterogenous Multi-Agent Robotic Network*," Proceedings of IEEE GHTC-SAS, August 2013.

Activities and affiliations

- Member of Electronics team at Delft Aerospace Rocket Engineering
- Student Coordinator of IIST Robotics Laboratory - hosted robotics events like line-follower, robo-wars
- Co-founder and Secretary of IIST Physics Club - conducted weekly student discussions and exhibitions
- Event Manager at Conscientia: IIST's Annual Techno-Astronomy Festival
- Member of On-Board Computer Team of IIST Student Nano-Satellite Project
- Editor of Drishtikon-2013, IIST's Annual Magazine
- Senior School Prefect at the Assembly of God Church School, Kolkata, India

Technical interests: Kolmogorov complexity , recursive self-adaptive systems , quine programming , swarm intelligence , cognitive computing , game theory , non-invasive brain-computer interface , gamification , fractals , esolangs

Hobbies: music (keyboard, harmonium and santoor) , art (oil painting, tessellations, cubism) , sculpting (kirigami, impossible architectures) , photography (long exposure) , philosophy (finitism, agnosticism, semasiology, participatory epistemology) , cooking (cuisine fusion) , poetry , archery