

Toshit Jain

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Publications

pyParaOcean: A System for Visual Analysis of Ocean Data, *EuroVis2023* [🔗](#)

Toshit Jain, Varun Singh, Vijay Kumar Boda, Upkar Singh, Ingrid Hotz, P. N. Vinayachandran, Vijay Natarajan

Experience

11/2022 – present

Research Associate, *Indian Institute of Science*

- Current work involves coming up with robust and scalable visualizations for fine resolution (1-3 km) ocean data.
- Developed an interactive system for oceanographers to explore, identify and track important features of the ocean including, but not limited to, particle paths, mesoscale eddies, high salinity cores and isotherms through 3D spatiotemporal ocean data.
- Improved efficiency of the visualization system by employing a server-client architecture and making the visualization modules parallel ready for a headless machine like a cluster or a supercomputer.
- Working on a Parallel I/O strategy for speeding up temporal visualizations when dealing with a large number of timesteps.

07/2021 – 10/2022

Software Engineer II, *Walmart Global Tech*

- Worked in the Order Management System (OMS) team that handles the life cycle of an order from its inception to its fulfillment.
- Migrated the OMS database from a SQL based DB to non SQL based Azure CosmosDB.
- Designed and helped in integrating an entirely new type of order, PetRx (medicines for Pets), into the existing OMS flow.
- Contributed to get the new Omni-Channel (a platform that combines Walmart's General Merchandise and Grocery businesses into one seamless platform) ready for holidays where orders would peak to 250,000 orders per minute.
- Day to day tasks also include writing APIs using OOP paradigms coupled with threading and transaction handling.

05/2020 – 07/2020

Software Developer Intern, *Walmart Global Tech*

- Work was mainly aimed at testing the response and security of the new Omni-Channel APIs.
- Integrated the Omni-Channel APIs with ASTRA tool(Automated Security Testing for REST APIs) for auto-detection and testing the login and logout across multiple authentication APIs and enabling quick integration of the APIs into CICD pipeline.

- Wrote ASTRA modules for taking in a bulk input of APIs and performing stand-alone security tests on each of them.

01/2020 – 04/2020

Teaching Assistant, *Dept. of Computer Science and Information Systems, BITS*

- Responsible for maintaining and upgrading the servers of the Computer Science Department.
- Successfully migrated department servers to a new virtualization technology while preserving all the data and environment variables.

05/2019 – 07/2019

Software Developer Intern, *Parinati Solutions*

- Worked on studying and implementing various automated strategies for trading cryptocurrencies using indicators like Aroon Oscillator, Bollinger Bands and Trade Liquidation.
- Backtested all the strategies on online virtual trading platforms like Tesnet and Binance.

04/2019 – 07/2020

President, *Computer Science Association, BITS*

- Was elected the president of the Official Student Body of the Dept. of Computer Science and Information Systems, BITS.
- Was responsible for organizing workshops, talks and competitions for the student body and acted as their representative in the Department of Computer Science.

Talks

2023

Leipzig, Germany

pyParaOcean: A System for Visual Analysis of Ocean Data,

EnvirVis Workshop at the EuroVis Conference [↗](#)

2023

Bangalore, India

Diving into Data: Exploring Ocean Insights through Visualization,

Bangalore Vis Workshop

Selected Projects

Machine Vision based Aerospace Vehicle Assembly Component Identification,

Computer Vision, Image Processing

- Worked on creating a machine vision based system that automatically sorts various assembly parts of an aerospace vehicle for **The Defence Research and Development Organisation**, Ministry of Defence, Government of India, as part of my **Undergraduate Thesis**.
- Successfully delivered a system consisting of a hardware rig with dual camera setup to identify the part kept on its platform and accompanying software that was able to detect the parts with 100% accuracy.
- Created a **Novel Technique** for measuring the Pitch of a bolt from an image.

Survey Of Quantum Microarchitectures, *Quantum Computing*

- Surveyed various kinds of Quantum Microarchitectures, Quantum Assembly Languages and Quantum Data Storage for a Study Oriented Project

Ranked Multi-Keyword Search over Encrypted Cloud Data, *Cryptography, Information Retrieval*

- Analyzed and implemented different search strategies for searching through encrypted data over cloud
- Explored and compared similarity spaces and precision of different techniques for TF-IDF like Inner Product Similarity and Euclidean Distance.

- Modified algorithms to make them more secure by using different encryption schemes and adding dummy keywords to increase result and keyword privacy and achieve trapdoor unlinkability (same query gets different trapdoors each time).

Online Dating Platform for College Students, *Software Engineering, Web Development*

- Developed a **web app** [↗](#) , using React and NodeJS, to match people based on their common dislikes.

Education

2017 – 2021

Bachelor of Engineering, Computer Science,

Birla Institute of Technology and Science(BITS) Pilani

- Thesis: Machine Vision based Aerospace Vehicle Assembly Component Identification
- Placed in First Division.
- CGPA: 7.51/10

Extra-Curricular

Graphic Design and Illustration

Enjoy taking a bundle of boring, but essential information and use design to make it much more interesting and aesthetically pleasing. **Link to my portfolio.** [↗](#)

Skills

Visualization • Parallel Programming • Computational Topology • Computational Geometry • High Performance Computing • Algorithms • Data Structures • Computer Vision • Image Processing • Cryptography • Software Engineering • Information Retrieval • Data Science • Operating Systems • Computer Networks • Database Systems • Computer Architecture • Compiler Design

ParaView • vtk • ttk • OpenMPI • OpenCV • Python • C/C++ • Java • Jenkins • Docker • Azure CosmosDB • MySQL • Git • Bash