

# Toshit Jain

✉ toshitjain93@gmail.com [🔗 Webpage](#) [🌐 LinkedIn](#)

## Education

---

- 2024 – 2029(expected)  
Salt Lake City, USA
- Ph.D., Computer Science, University Of Utah**
- **Advisor:** Professor Bei Wang Phillips
- 2017 – 2021  
Hyderabad, India
- Bachelor of Engineering, Computer Science,**  
*Birla Institute of Technology and Science(BITS) Pilani*
- **Advisor:** Professor Tathagata Ray
  - **Thesis: Machine Vision based Aerospace Vehicle Assembly Component Identification**
  - Placed in First Division, CGPA: 7.51/10

## Publications

---

- 2024
- A Scalable System for Visual Analysis of Ocean Data,**  
*Computer Graphics Forum*
- Toshit Jain,** Upkar Singh, Varun Singh, Vijay Kumar Boda, Ingrid Hotz, Sathish S. Vadhiyar, P. N. Vinayachandran, Vijay Natarajan
- 2023
- 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

---

- 08/2024 – present  
Salt Lake City, USA
- Graduate Research Assistant,**  
*Scientific Computing and Imaging (SCI) Institute, University of Utah* [🔗](#)
- Advisor:** Professor Bei Wang Phillips
- Working on Uncertainty Visualization of Hypergraph Ensembles
- 11/2022 – 07/2024  
Bangalore, India
- Research Associate, Indian Institute of Science**
- Advisor:** Professor Vijay Natarajan
- work involved 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  
Bangalore, India
- 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  
Bangalore, India

**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  
Hyderabad, India

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

**Mentor:** Professor Dipanjan Chakraborty

- 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  
Goa, India

**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  
Hyderabad, India

**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*

## Preprints

---

### Development of Machine Vision Approach for Mechanical Component Identification based on its Dimension and Pitch [↗](#)

**Toshit Jain**, Faisal Mushtaq, K Ramesh, Sandip Deshmukh, Tathagata Ray, Chandu Parimi, Praveen Tandon, Pramod Kumar Jha

## Selected Projects

---

### Machine Vision based Aerospace Vehicle Assembly Component Identification,

*Computer Vision, Image Processing*

**Advisors:** Professor Tathagata Ray, Professor Sandip Singh Deshmukh

- 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.

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

**Advisor:** Professor D.V.N. Siva Kumar

- 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).

### Survey Of Quantum Microarchitectures, *Quantum Computing*

**Advisor:** Professor Suvadip Batabyal

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

## Extra-Curricular

---

### Graphic Design and Illustration

I 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, Machine Learning, Natural Language Processing, 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, Compiler Design

ParaView, VTK, TTK, OpenMPI, OpenCV, Python, C/C++, Java, Git, Bash, Jenkins, Docker, Azure CosmosDB, MySQL

## Languages

---

**English, Hindi, Punjabi**