

Tushar Athawale

tushar.athawale@gmail.com • Pune, Maharashtra, India • <http://tusharathawale.info>

OBJECTIVE

To build a long-term career in the scientific computing and visualization domain by devising novel and efficient solutions to the challenging research problems in the analyses of large-scale data

SUMMARY

- Expertise in the field of uncertainty quantification for visualization of scientific data
- Strong background in statistical analysis demonstrated through publications
- Strong interpersonal skills developed through collaborative research conducted in academia and the role of technical support engineer at MathWorks
- Computer Languages: C++, C, OpenGL, CUDA, Latex
- Computer Software: MATLAB, Maple, ParaView, and Isosurface Jeneration Kode (IJK)

EDUCATION

Doctor of Philosophy in Computer and Information Science and Engineering **May 2015**

University of Florida, Gainesville, FL

GPA: 3.75/4.00

Master of Science in Computer and Information Science and Engineering **May 2014**

University of Florida, Gainesville, FL

GPA: 3.75/4.00

Relevant Coursework: Analysis of Algorithms, Advanced Data Structures, Computer Graphics, GPU Architecture and Programming, Machine Learning

Bachelor of Engineering in Computer Engineering **May 2010**

University of Pune, Pune, India

GPA: 8.81/10.00

RESEARCH INTERESTS

- Scientific Visualization
- Uncertainty Quantification
- Statistical Analysis

EXPERIENCE

Postdoctoral Fellow, University of Utah, Salt Lake City, Utah **October 2016 – October 2019**

- Uncertainty visualization for level sets extracted using the marching squares/cubes algorithm
- Uncertainty visualization of imaging in deep brain stimulation domain for treating Parkinson's patients
- Co-instructor for courses: Decomposition Techniques for Computational Data-Enabled Science Engineering, Visualization for Scientific Data (<http://tusharathawale.info/teaching/>)
- Reviewed several peer-reviewed journal papers published in IEEE VIS and EuroVis conferences

Application Support Engineer, MathWorks, Inc., Natick, MA **July 2015 – October 2016**

- Provided solutions to complex technical issues experienced by the customers working with MATLAB
- Worked as a lead contributor to the design and implementation of the in-built MATLAB function IMROTATE3 introduced in the release of R2017a for rotation of 3D images
- Conducted technical interviews for hiring new candidates for the technical support engineering role

Research Assistant, University of Florida, Gainesville, FL **August 2011 – May 2015**

- Studied the marching cubes algorithm for isosurface extraction in uncertain data

Teaching Assistant, University of Florida, Gainesville, FL **August 2011 – May 2015**

- **Courses:** Computer Graphics, Advanced Data Structures, and Basic Java Programming
- Assisted students in problem solving and grading of the courses
- Presented on Nvidia's CUDA technology and conducted Java programming labs for undergraduate classes

Software Engineering Intern, Nvidia Corporation, Pune, India **August 2009 – May 2010**

- Studied the screen space ambient occlusion (SSAO) algorithm used in computer graphics
- Embedded game-specific SSAO profiles into the Nvidia drivers for video games, such as Gears of War

JOURNAL PUBLICATIONS

(Google Scholar profile: <https://scholar.google.com/citations?user=sMiEw1YAAAAAJ&hl=en>)

- T. M. Athawale, D. Maljovec, C. R. Johnson, V. Pascucci, and B. Wang, Uncertainty Visualization of 2D Morse Complex Ensembles Using Statistical Summary Maps, *submitted to IEEE Transactions on Visualization and Computer Graphics*, Dec 2019 (<https://arxiv.org/abs/1912.06341>)
- T. M. Athawale and C. R. Johnson, Probabilistic Asymptotic Decider for Topological Ambiguity Resolution in Level-Set Extraction for Uncertain 2D Data, *IEEE Transactions on Visualization and Computer Graphics*, Special Issue on IEEE Visualization, vol. 25, no. 1, pp 1163-1172, Jan 2019
- T. M. Athawale, K. A. Johnson, C. R. Butson, and C. R. Johnson, A Statistical Framework for Quantification and Visualization of Positional Uncertainty in Deep Brain Stimulation Electrodes, *Computer Methods in Biomechanics and Biomedical Engineering: Imaging & Visualization*, vol. 7, no. 4, pp. 438-449, 2019
- T. M. Athawale, E. Sakhaee, and A. Entezari, Isosurface Visualization of Data with Nonparametric Models for Uncertainty, *IEEE Transactions on Visualization and Computer Graphics*, Special Issue on IEEE Visualization, vol. 22, no. 1, pp. 777-786, August 12, 2015
- T. M. Athawale and A. Entezari, Uncertainty Quantification in Linear Interpolation for Isosurface Extraction, *IEEE Transactions on Visualization and Computer Graphics*, Special Issue on IEEE Visualization, vol. 19, no. 12, pp. 2723-2732, October 16, 2013

CONFERENCE PUBLICATIONS

- T. M. Athawale, K. A. Johnson, C. R. Butson, and C. R. Johnson, A Statistical Framework for Visualization of Positional Uncertainty in Deep Brain Stimulation Electrodes, *2019 IEEE Workshop on Visual Analytics in Healthcare (VAHC)*, pp. 54-55, 2019

CONFERENCE PRESENTATIONS

International Conference on Machine Learning and Information Processing (ICMLIP), Pune, India

December 2019

- **Title:** Statistical Analysis for Uncertainty Quantification and Visualization of Scientific Data
- Delivered a keynote talk at the conference

Visual Analytics in Healthcare (VAHC), Vancouver, BC, Canada

October 2019

- **Title:** A Statistical Framework for Visualization of Positional Uncertainty in Deep Brain Stimulation Electrodes
- Poster: <http://tusharathawale.info/wp-content/uploads/2019/10/dbselectrodespositionaluncertainty-compressed.pdf>

IEEE VIS 2018, Berlin, Germany

October 2018

- **Title:** Probabilistic Asymptotic Decider for Topological Ambiguity Resolution in Level-Set Extraction for Uncertain 2D Data
- Presentation slides: <http://tusharathawale.info/wp-content/uploads/2019/02/VISpresentation18.pdf>
- Video preview: <https://vimeo.com/290325318>

IEEE VIS 2015, Chicago, IL

October 2015

- **Title:** Isosurface Visualization of Data with Nonparametric Models for Uncertainty
- Presentation slides: <http://tusharathawale.info/wp-content/uploads/2019/02/VISpresentation15.pdf>
- Video preview: <https://vimeo.com/136147397>

IEEE VIS 2013, Atlanta, GA

October 2013

- **Title:** Uncertainty Quantification in Linear Interpolation for Isosurface Extraction
- Presentation slides: <http://tusharathawale.info/wp-content/uploads/2019/02/VISpresentation13.pdf>
- Video preview: <https://vimeo.com/74500826>

INVITED TALKS

Indian Institute of Science (IISc), Bengaluru, India

November 2019

- **Title:** Statistical Analysis for Uncertainty Quantification and Visualization of Scientific Data
- **Host:** Dr. Vijay Natarajan from the Department of Computer Science and Automation at IISc

Oak Ridge National Laboratory (ORNL), Oak Ridge, Tennessee

May 2019

- **Title:** Statistical Analysis for Uncertainty Quantification and Visualization of Ensemble/Large-Scale Data
- **Host:** Dr. Dave Pugmire and Dr. Scott Klasky from the Scientific Data Group at ORNL

Los Alamos National Laboratory (LANL), Los Alamos, New Mexico

December 2018

- **Title:** Statistical Analysis for Quantification and Visualization of Spatial Variability in Features of Uncertain Data

- **Host:** Dr. James Ahrens from the Data Science at Scale Group in LANL

ACADEMIC PROJECTS

August 2010 – August 2012

- **Computer Graphics:** Implemented shading, rasterization, and z-buffering stages of the graphics pipeline; the loop subdivision algorithm for smooth surfaces; and smoothing filters for image processing
- **Machine Learning:** Designed and implemented systems in a supervised machine-learning framework that utilize techniques such as least squares, principal component analysis, and local-linear embedding
- **CUDA:** Developed CUDA applications for fast matrix multiplication and the breadth-first search

INVOLVEMENT

Seminar and External Examiner, Vishwakarma Institute of Technology, Pune, India **December 2019**

- Delivered a seminar to undergraduate students explaining comparisons between the industry and research tracks
- Took the role of External Examiner for evaluating undergraduate student projects

Poster Evaluations, University of Utah, Salt Lake City, UT **April 2018, April 2019**

- Evaluated undergraduate student posters presented at the [Undergraduate Research Symposium](#)

Treasurer, Gator Cricket Club at UF, Gainesville, FL **August 2014 – December 2014**

- Performed accounting duties related to tournament organizations and fundraising events

Student Volunteer, IEEE VIS 2013, Atlanta, GA **October 2013**

- Helped in miscellaneous activities, such as setting up the speaker/poster sessions at the conference

WORK STYLE

- Investing time and resources appropriately
- Ability to take decisions with minimal guidance
- Strong communication skills and positive attitude
- Continuous learning and self-improvement