

Ritesh Sharma

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<https://sharmrit.github.io/Homepage>

Education

Ph.D. in Computer Science (CGPA 4.0/4.0)

August, 2018 - June, 2022 (Expected)

Computer Graphics and Animation

Research Area: Path planning, Navigation, Spatial representation and Visualization

Advisor: Professor Marcelo Kallmann

University of California, Merced, California

M.S. in Computer Science (CGPA 3.45/4.0)

March, 2017

Computer Graphics and Visualization

Thesis: Interactive Design and Transition Point Analysis of 3D Linear Symmetric Tensor Fields

Advisor: Professor Eugene Zhang

Oregon State University, Corvallis, Oregon

B. Tech. in Computer Science and Engineering (CGPA 8.45/10)

August, 2010

West Bengal University of Technology, India

Professional Experience

Graduate Student Researcher, University of California, Merced, United States

May 19 - Present

- Investigating on research topics in Path planning, Navigation and Crowd Simulation in 2D and 3D and visualization of navigation metrics in 2D.

PhD Researcher(Intern), Hasso-Plattner-Institut, Potsdam, Germany

May 20 - present

- Investigating on geometry interaction related to laser cutting.

Senior Graphics Programmer, Passur Aerospace Inc., United States

May 17 - August 18

- Software Development
 - Developed interactive graphical user interface and visualize shape files for new functionalities in Passur's web tracker and desktop-based flight tracking system.
 - Contribute to back-end by writing server side code to communicate with database.
 - Research and Analyzed different JavaScript framework and built functionality which will contribute to the foundation of the company's future product that will be used by major airlines and airports both in US and International with React/Redux from scratch

Intern (Mathematica Algorithm R&D), Wolfram Research Inc., United States

Apr 16 - Aug 16

- Software Development
 - Developed software package to connect Wolfram's Mathematica with Pixar's Renderman.
 - Software package testing for geometry primitives, plot functions and functionalities used for 3D Printing.

Graduate Research Assistant, Oregon State University, United States

Mar, 14 - Dec, 16

- 3D Symmetric Tensor Field Analysis and Visualization
 - Improved topology extraction techniques using A-Patches and by solving analytical solutions.

Research Assistant, Indian Institute of Technology Bombay, India

Oct, 10 - Dec, 13

- Virtual Laboratory for Urban Transportation System Planning Course
 - Developed an accurate, reliable and autodidactic web-based virtual laboratory

Publications

- **Sharma, R.,** Weiss, T., Kallmann, R., Formation-Aware Planning and Navigation, Eurographics (Full paper), 2021 (Submitted).

- **Sharma, R.**, Weiss, T., Kallmann, R., *Plane-Based Local Behaviors for Multi-Agent 3D Simulations with Position-Based Dynamics*, IEEE International Conference on Artificial Intelligence and Virtual Reality (IEEE AIVR), 2020.
- **Sharma, R.**, Weiss, T., Kallmann, R., *3D Behaviors for Multi-Agent Simulations with Position-Based Dynamics*, ACM SIGGRAPH Symposium of Interactive 3D Graphics and Games(I3D) 2020 (Poster paper), San Francisco, United States, 14th-18th September, 2020.
- **Sharma, R.**, Farias, R., Kallmann, R., *Integrating Local Collision Avoidance with Shortest Path Maps*, EuroGraphics 2020 (Poster paper), Norrkoping, Sweden, May 25th-29th, 2020.
- **Sharma, R.**, Tomson, A., Lobato, E., Kallmann, R., Padilla, L., *Data Driven Multi-Hazard Risk Visualization*, EuroVis 2020 (Poster paper), Norrkoping, Sweden, May 25th-29th, 2020.
- Zhang, Y., **Sharma, R.**, Zhang, E., *Maximum Number of transition points in a 3D Linear Symmetric Tensor Fields*, TopoInVis 2017, Tokyo, Japan, Feb 27th-28th, 2017
- Jenny, B., Stephen, D. M., Muehlenhaus, I., Marston, B. E., **Sharma, R.**, Zhang, E., Jenny, H, *Force-directed layout of origin-destination flow maps*, International Journal of Geographic Information Science (IJGIS), 2017
- Zhang, E., Palacios, J., Yeh, H., Wang, W., Zhang, Y., Laramée, B., **Sharma, R.**, Schultz, T., *Feature Surfaces in Symmetric Tensor Fields Based on Eigenvalue Manifold*, IEEE TVCG, Issue 99, March 1, 2016. Also featured at **ACM SIGGRAPH ASIA 2016** and **IEEEVIS 2016**.
- Jenny, B., Stephen, D. M., Muehlenhaus, I., Marston, B. E., **Sharma, R.**, Zhang, E., Jenny, H, *Design Principles for Origin-destination Flow Maps*, Cartography and Geographic Information Science (CaGIS), 2016
- Nelson, V., **Sharma, R.**, Zhang, E., Schmittner, A., Jenny, B., *3D visualization of global ocean circulation*, AGU Fall Meeting, San Francisco, CA, Dec 18, 2015
- Stephen, D., Jenny, B., **Sharma, R.**, Zhang, E., Muehlenhaus, I. (2015). *Automatic Flow map creation using a force-directed layout*. North American Cartographic Information Society Annual Meeting, Minneapolis, MN Oct. 15, 2015
- **Sharma, R.**, Jadhav, S., Tripathy, D., Sardar, V. H., Patil, G. R., *Virtual Laboratory: An alternative approach to Urban Transportation Systems Planning* Lab, Transportation Research Board, 93rd Annual Meeting, Washington, D.C, USA, 2014

Technical Skills

- **Programming and Scripting Languages:** C(Proficient), C++(Proficient), GLSL, PHP, HTML, CSS, Javascript, JQuery, Wolfram Language
- **Frameworks and Platforms:** wxWidgets, QT, OpenGL, OpenMP, OpenCL, EmberJS, React, Redux, GitHub, GitLab and Stash
- **Software:** Microsoft Visual Studio, Matlab, Eclipse, Netbeans, Renderman, Mathematica, Wolfram Workbench, Rhinoceros 3D, Unity3D, Unreal Engine 4.0, WebStorm 2018

Teaching Experience

Teaching Assistant, University of California Merced

August 18 - June 20

- CS 020: Introduction to Computing I: Java (Spring 2020)
- CS 030: Data Structures (Fall 2018, Spring 2019)
- CS 170: Computer Graphics (Fall 2019)

Graduate Teaching Assistant, Oregon State University

Jan, 14 - March, 17

- CS 325: Analysis of Algorithm (Winter 2016)
- CS 340: Introduction to Databases (Spring 2014, Spring 2015, Summer 2015)
- CS 344: Operating Systems I (Winter 2017)
- CS 480: Translators (Winter 2014)

Academic Projects

- *Predictive Modeling of Flood Susceptibility, Phase 1*
 - Worked with group of researcher from different discipline at UC Merced and USRA (University Space Research Association) for modeling and visualization of predictive based flood visualization.
- *Realtime Multi-Agent Crowd Simulation*
 - Implemented algorithm from the paper titled *Position-Based Multi-Agent Dynamics for Real-Time Crowd Simulation* by T. weiss et. al.(2017), as part of *Computer Animation and Simulation Class* at UC Merced.
- *3D visualization of global ocean circulation*
 - Developed a visualization tool for showcasing mixing of ocean water at different density level and its effect on the distribution of tracers such as carbon isotopes.
- *Isosurface Extraction using A-Patches*
 - Achieved a better isosurface defined by a polynomial of any degree using A-Patch.
- *Smoke Simulation*
 - Implemented particle based method to simulate smoke.
- *Pool Game Animation*
 - Implemented Pool game simulation.
- *Flow Visualization*
 - Implemented Line Integral Convolution to visualize vector field using streamlines.

Graduate Course Highlights

University of California Merced	Grades
• <i>EECS 287: Computer Animation and Simulation</i>	A
Oregon State University	
• <i>CS 551: Computer Graphics</i>	A
• <i>CS 554: Geometric Modeling</i>	A-
• <i>CS 557: Computer Graphics Shaders</i>	A
• <i>CS 575: Intro to Parallel Computing</i>	A

Awards

- *EECS Bobcat Travel Fellowship 2020*
- *Travel award for NSF sponsored SOCG 2019, Portland, Oregon*
- *EECS Bobcat Fellowship 2019*
- *EECS Bobcat Travel Fellowship 2019*
- *Received Honorary Citizenship of Corvallis, Oregon for contributions and achievements at Oregon State University by the mayor of city of Corvallis, Oregon, United States*

Journal/Proceedings Reviewer

- *ACM MIG 2019, ACM MIG 2020, ICAPS 2019, CASA 2019, CASA 2020*

Co-Curricular

- *Peer mentor for two first year PhD students under UC Merced GRAD-EXCEL Peer Mentor Program for the academic year 2020-2021.*
- *Served as the Secretary of the Merced Indian Graduate Student Association (MIGSA) at University of California Merced for the academic year 2019-2020, California, USA*

- *Poster Presentation on “3D Symmetric Tensor Field Visualization” at Engineering Research Expo held at Portland Art Museum, Portland, Oregon, Mar 1, 2016.*
- *Mentored a senior undergraduate student under REU (Research Experience for Undergraduate) Program during Summer 2015, funded by NSF.*
- *Poster Presentation on “Mode Surface Extraction Using A-Patches” at Engineering Research Expo held at Oregon Convention Center, Portland, Oregon, Mar 4, 2015.*
- *ACM and ACM SIGGRAPH Student Member since 2015*
- *Served as Student Volunteer at ACM SIGGRAPH 2019 held at Los Angeles, July 28th - August 1st, 2019*

References

Professor Marcelo Kallmann (PhD Advisor)

University of California, Merced, USA

Email: mkallmann@ucmerced.edu

Professor Patrick Baudisch

Hasso-Plattner-Institut, Potsdam, Germany

Email: patrick.baudisch@hpi.de

Professor Tomer Weiss

New Jersey Institute of Technology, USA

Email: tweiss@njit.edu

Matt Marcella

SVP, Software Development, Passur Aerospace Inc.

Email: mattmarcella@passur.com

Charles Pooh

Manager, Mathematica Algorithm R & D

Wolfram Research Inc.

Email: charlesp@wolfram.com