

# Ritesh Sharma

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

## Education

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

August, 2018 - Present

Computer Graphics and Animation

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

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

May 19 - Present

- Investigating on research topics such as Computer Graphics, Geometry Processing, Path planning and Navigation in higher dimensional space.

### 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

## Teaching Experience

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### Teaching Assistant, University of California Merced

August 18 - Present

- CS 030: Data Structures (Fall 2018, Spring 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)

## Publications

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- 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 **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

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- **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 and Stash
- **Software:** Microsoft Visual Studio, Matlab, Eclipse, Netbeans, Renderman, Mathematica, Wolfram Workbench, Rhinoceros 3D, Unreal Engine 4.0, WebStorm 2018

## Academic Projects

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- *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

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- *EECS 287: Computer Animation and Simulation* A

### Oregon State University

- *CS 551: Computer Graphics* A
- *CS 554: Geometric Modeling* A-
- *CS 557: Computer Graphics Shaders* A
- *CS 575: Intro to Parallel Computing* A

### Awards

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- *Travel award for NSF funded SOCG 2019, Portland, Oregon*
- *Summer 2019 EECS Bobcat Fellowship*
- *Spring 2019 EECS Bobcat Travel Fellowship*
- *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

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- *International Conference on Automated Planning and Scheduling (ICAPS) 2019, Association for the Advancement of Artificial Intelligence*
- *Computer Animation and Social Agents (CASA) 2019*

### Co-Curricular

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- *Currently holds the position of Secretary(as of 04.01.2019) of the Merced Indian Graduate Student Association (MIGSA) at University of California, Merced, California, USA*
- *ACM and SIGGRAPH Student Member since 2015*
- *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.*