

EXPERIENCE	Argonne National Laboratory Postdoctoral Appointee Implemented a parallel particle tracer for in-situ analysis and visualization of MPAS-Ocean simulation output. Researched and implemented novel load balancing methods for the parallel particle tracer. Languages used: C++/Fortran.	May 2018 - May 2021
	SCI Institute, Univ. of Utah Graduate Research Assistant Developed novel visualizations and statistical methods to summarize ensemble data of various types such as ensembles of isosurfaces, paths on a graph, high dimensional data and graphs. Languages used: Python, JavaScript, HTML, C++	Jul 2013 - May 2018
	Visual Perception lab, Univ. of Utah Graduate Research Assistant Designed and developed VR experiments to evaluate the effect of animated self avatars in virtual environments. Languages used: Python	Jan 2012 - Jun 2013
	Infosys labs, Infosys Tech. Ltd. Systems Engineer Maintained reporting module for a web accessibility, assessment & remediation tool and developed prototype social networking and augmented reality platform for retail customers. Languages used: Java, JavaScript, HTML, SQL	Jul 2008 - Jul 2011
	University of Utah, Salt Lake City PhD, Computing , GPA: 3.92 Thesis: Depth based Visualizations for Ensemble Data and Graphs Advisor: Ross T. Whitaker	2013 - 2018
EDUCATION	MS, Computing , GPA: 3.93 Thesis: Effect of Animated Self-avatars in Virtual Environments Advisors: William B. Thompson(Computing) & Sarah Creem-Regehr (Psychology)	2011 - 2013
	University of Pune, Pune BEng., Electronics & Telecomm. , First Class with Distinction Senior Project: Real-time Hand Gesture Recognition and Tracking	2004 - 2008
SKILLS	Languages : C++, Python, Javascript/Typescript, HTML Visualization tools : OpenGL, VTK/Paraview HPC/Parallel programming : MPI, C++11 threads Web technologies : React, babylon.js, d3 Other tools : L ^A T _E X, Git, CMake, spack, pnetcdf, vim, tmux	
AWARDS	<ul style="list-style-type: none">• 2021: IEEE Pacific Visualization Best Paper Award• 2019: IEEE Visualization Best Paper Award (Scientific Visualization track)• 2017: IEEE Visualization Doctoral Colloquium Travel Grant• 2016: Best Poster Award at UofUtah School of Computing annual poster session• 2016: Lt Governor of Utah's Certificate of Appreciation for Volunteering• 2015: Best Poster Award at UofUtah School of Computing annual poster session• 2010: Spot Award, an Infosys performance award, for work on VR platform• 2008: Medal for Best Senior Project in Electronics & Telecomm. department	

PUBLICATIONS

Journal

- Jiayi Xu, Hanqi Guo, Han-Wei Shen, Mukund Raj, Xueqiao Xu, Xueyun Wang, Zhehui Wang, Tom Peterka. Asynchronous and Load-Balanced Union-Find for Distributed and Parallel Scientific Data Visualization and Analysis, *IEEE Transactions on Visualization and Computer Graphics*, , 1-1, 2021
- Wenbin He, Junpeng Wang, Hanqi Guo, Ko-Chih Wang, Han-Wei Shen, Mukund Raj, Youssef S. G. Nashed, Tom Peterka. InSituNet: Deep Image Synthesis for Parameter Space Exploration of Ensemble Simulations, *IEEE Transactions on Visualization and Computer Graphics*, 26(1), 23-33, 2019
- Mukund Raj and Ross T. Whitaker. Visualizing Multidimensional Data with Order Statistics. *Computer Graphics Forum*, 37(3), 277-287, 2018
- Mukund Raj, Mahsa Mirzargar, Robert Ricci, Robert M. Kirby and Ross T. Whitaker. Path Boxplots: A Method for Characterizing Uncertainty in Path Ensembles on a Graph *Journal of Computational and Graphical Statistics*, 26(2), 243-252, 2016
- Mukund Raj, Mahsa Mirzargar, J. Samuel Preston, Robert M. Kirby, and Ross T. Whitaker. Evaluating Shape Alignment via Ensemble Visualization *IEEE Computer Graphics and Applications*, 36(3), 60-71, 2016

Peer Reviewed Conference

- Dmitriy Morozov, Tom Peterka, Hanqi Guo, Mukund Raj, Jiayi Xu, and Han-Wei Shen. IExchange: Asynchronous Communication and Termination Detection for Iterative Algorithms. *Proceedings of IEEE Symposium on Large Data Analysis and Visualization*, 2021. (Accepted)
- Xin Liang, Hanqi Guo, Sheng Di, Franck Cappello, Mukund Raj, Chunhui Liu, Kenji Ono, Zizhong Chen and Tom Peterka. Towards Feature Preserving 2D and 3D Vector Field Compression. *13th IEEE Pacific Visualization Symposium*, Tianjin, China, Apr 14-17, 2020.
- Mukund Raj and Ross T. Whitaker. Anisotropic Radial Layout for Visualizing Centrality and Structure in Graphs. *Proceedings of the 25th International Symposium on Graph Drawing & Network Visualization*, pp. 351-364, Springer, Cham, 2017
- Mukund Raj, Sarah H. CreemRegehr, Kristina M. Rand, Jeanine K. Stefanucci, and William B. Thompson. Kinect based 3D object manipulation on a desktop display. *Proceedings of the ACM Symposium on Applied Perception*, pp. 99-102, ACM, 2012

Patents

- U.S. Patent 9342630 B2, (granted), “System and Method for Monitoring and Analyzing Social Network Databases”

Posters

- Mukund Raj, Mahsa Mirzargar, Robert M. Kirby, Ross T. Whitaker. “Summarizing and Visualizing Graph Ensembles with Rank Statistics and Boxplots”. *2017 International Symposium on Graph Drawing and Network Visualization*, 09/25/17
- Mukund Raj, Robert M. Kirby, Ross T. Whitaker. “Network Boxplots: A Method to Visualize Network Ensembles”. *2016 School of Computing poster session (UofUtah)*, 02/19/16
- Mukund Raj, Mahsa Mirzargar, Robert M. Kirby, Ross T. Whitaker, “Generalized Data Depth and Applications”, *2015 School of Computing poster session (UofUtah)*, 02/20/15

PRESENTATIONS **Invited**
(selected)

- “Decoupled Parallel Particle Tracing and Visualization for Stochastic Flows”, Invited talk at Los Alamos National Laboratory (Los Alamos), 03/04/2019
- “Depth based Visualizations for Ensemble Data and Graphs”, Invited talk at U of Arizona CS colloquium (Tuscon), 10/03/17

Conference

- “Anisotropic Radial Layout for Visualizing Centrality and Structure in Graphs”, GD 2017 (Boston), 09/27/17
- “Evaluating Alignment of Shapes for Ensemble Visualization”, IEEE VIS 2016 (Baltimore), 08/27/16
- “Kinect based 3D object manipulation on a desktop display ”, ACM SAP 2012 (Los Angeles), 08/04/13

Seminars

- “Graph Kernels for Chemical Informatics”, Data Group Seminar (UofUtah, 11/10/15
- “Generalized Notions of Data Depth”, Data Group Seminar (UofUtah), 03/12/15
- “The Power Crust”, SCI Imaging Seminar (UofUtah), 04/23/12

SERVICE

Reviewer

- 2021: IEEE Visualization, IEEE PacificVis, IEEE/ACM CCGrid, The Visual Computer
- 2020: IEEE Visualization, Journal of Visualization, IEEE Computational Science and Engineering
- 2019: IEEE Visualization, Journal of Visualization, Scientific Programming, International Conference on Image & Graphics, Workshop on Visual Analytics in Healthcare
- 2018: IEEE Visualization, EuroVis

Other

- 2020-2021: Mentor, NAACP’s Afro-Academic, Cultural, Technological and Scientific Olympics (ACT-SO)
- 2020: Volunteer, Argonne Coding for Science Camp
- 2019: Volunteer, Argonne CAPS High School Computing Workshop
- 2018: Symposium Organizing Committee Member, Argonne Postdoctoral Symposium
- 2016: Volunteer Coordinator, UServeUtah Cyber Seniors (Pilot) Program
- 2012: Student Volunteer, Siggraph