

ADITYA SANKAR

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Education

- University of Washington, Seattle, WA** 2017
Ph.D., Computer Science and Engineering
Advisor: Steve Seitz
Thesis: Interactive In-Situ Scene Capture on Mobile Devices
Research Interests: Graphics, Vision and Human-Computer Interaction
- University of Washington, Seattle, WA** 2012
M.S., Computer Science and Engineering
- Dhirubhai Ambani Institute of Information and Communication Technology, India** 2008
B.Tech., Information and Communication Technology

Research Themes & Projects

Productivity and Well-Being Applications of Augmented and Virtual Reality

I am interested in investigating the use of VR/AR technology in a variety of productivity and well-being applications. Recent projects in this theme include novel uses of AR in dental surgery, use of VR in prisons with the goal of reducing recidivism, using AR for academic note-taking, and others. Interested in tackling the novel graphics, vision, and interaction challenges posed by these applications.

Interactive In-Situ 3D Scene Capture on Mobile Devices – *Advisor: Steve Seitz (UW)*

Explored novel techniques and systems that let non-expert users quickly and easily capture useful architectural visualizations of indoor scenes. The visualizations include virtual tours, 2D floor plans and 3D CAD models. The systems were implemented on a range of commodity mobile hardware, including phones, tablets, 3D-aware devices and head-mounted AR devices.

Preserving Heritage with Interactive Narratives – *Mentors: P. Anandan & Joseph Joy (Microsoft Research)*

Contributed data models, interaction design, system development, and multimedia content for a project to preserve natural and cultural heritage using Rich Interactive Narratives (RINs). RINs combine traditional forms of storytelling with new visualization technologies to create compelling interactive experiences. Was primary designer and developer of a pilot project that let users experience interactive, immersive, 3D virtual tours of famous Indian heritage sites.

Work Experience

Research Scientist, Apple Inc., Seattle

June 2018 – present

At Apple, I am conducting research on Machine Learning, Artificial Intelligence, 3D Computer Vision, Augmented & Virtual Reality (AR/VR). I am also devising innovative engineering solutions to bring the research into Apple products. My role will help the company discover and define the next generation of hardware and software products which will impact the future of computing.

Director of Research and Education, *Reality Lab, University of Washington, Seattle* Mar 2018 – June 2019
 Founding member of the UW Reality Lab, playing a key role in defining and creating the next generation of AR and VR experiences through research and education. I will be leading a range of graduate and undergraduate research projects, and continuing my own research in computer vision, graphics, and HCI.

Lecturer, *University of Washington, Seattle, WA* Mar 2018 – present
 Responsibilities include the development and teaching of new VR/AR capstone courses, organizing lectures, coordinating VR/AR educational efforts across campus and overseeing the VR curriculum in the School of Computer Science and Engineering at UW.

Research Assistant, *University of Washington, Seattle, WA* Sep. 2009 – Dec 2017
 Graduate Student researcher working on problems related to computer vision, computer graphics and human-computer interaction. Job responsibilities included creating research software prototypes, analyzing data, writing articles, and national/international presentations of research results.

Research Intern, *Floored Inc, New York, NY* June 2013 – Aug 2013
 Research Intern at a early-stage startup in New York City that focused on the creation of high-fidelity 3D models for real estate. My role included the research and development of 3D computer vision software to automatically generate floor plan layouts, 3D models and point-clouds from laser range scan data.

Research Intern, *FUSE Labs, Microsoft Research, Redmond, WA* June 2011 – Aug 2011
 Research Intern at a major industrial research lab, focusing on the sensor fusion of data from range scanning sensors, cameras, gyroscopes and accelerometers, in order to enable the future of social experiences (FUSE). Prototypes built include a home activity tracking system and a game controller.

Research Intern, *Microsoft Research India, Bangalore, India* Summer 2007, 2008, 2010
 Multiple research internships at Microsoft Research Lab India, working on a variety of projects with the Advanced Development and Prototyping Group. Including, developing user interfaces and interaction models to facilitate collaboration over the Internet, creating methods to effectively represent location tagged images in the form of a digital travelogue. Also served as the primary designer and developer of a system that enables users to experience an interactive, immersive virtual tours of famous heritage sites.

Research Software Developer, *Microsoft Research India, Bangalore, India* July 2008 – Aug 2009
 Working in the Advanced Development and Prototyping team, contributing to the design and development of ongoing research projects at Microsoft Research India.

Publications

E. Dupont, M. A. Bautista, A. Colburn, **A. Sankar**, C. Guestrin, J. Susskind, Q Shan. Equivariant Neural Rendering. *Proc. International Conference on Machine Learning (ICML)*, 2020. (To Appear)

Y. Zhou, P. Yoo, Y. Feng, **A. Sankar**, A. Sadr, E. Seibel. Towards AR-assisted Visualization and Guidance for Imaging of Dental Decay. *In Research Journal of the Institution of Engineering and Technology, Healthcare Technology Letters*, 2019. Vol. 6 (6), pp. 243–248.

E. A. Björling, R. Cicero, **A. Sankar**, A. Sekar. Thought Disposal: Co-Designing a virtual interaction to reduce stress in teens. *Proc. ACM International Conference on Interaction Design and Children (IDC)*, 2019. pp. 562–567.

A. Sankar, S. M. Seitz. Interactive Room Capture on 3D-Aware Mobile Devices. *Proc. ACM Symposium on User Interface Software and Technology (UIST)*, 2017, pp. 415–426.

A. Sankar, S. M. Seitz. In-Situ CAD Capture. *Proc. International Conference on Human-computer Interaction with Mobile Devices (MobileHCI)*, 2016, pp. 233–243.

A. Sankar, In-situ Semantic 3D Modeling *Proc. International Conference on Human-computer Interaction with Mobile Devices (MobileHCI)*, 2016, pp. 909–910.

A. Sankar, S. M. Seitz. Capturing Indoor Scenes with Smartphones. *Proc. ACM Symposium on User Interface Software and Technology (UIST)*, 2012, pp. 403–412.

N. Adabala, N. Datha, J. Joy, C. Kulkarni, A. Manchepalli, **A. Sankar**, R. Walton. An Interactive Multimedia Framework for Digital Heritage Narratives. *Proc. of ACM Multimedia (MM)*, 2010, pp. 1445–1448.

I. Kemelmacher-Shlizerman, **A. Sankar**, E. Shechtman, S. M. Seitz. Being John Malkovich. *Proc. Eur. Conf. on Computer Vision (ECCV)*, 2010, pp. 341–353.

A. Sankar, A. Prasad, J. Joy, N. Datha, A. Manchepalli. Digital Heritage. *EA on Human Factors in Computing Systems (CHI)*, 2009, pp. 3503–3504.

For full publication list see Google Scholar: <https://scholar.google.com/citations?user=6ZDIIdEAAAAAJ>

Dissertation

A. Sankar, Ph.D. Thesis, Interactive In-Situ Scene Capture on Mobile Devices. *University of Washington*, 2018.

Patents

Indoor Scene Capture System, **A. Sankar**, S. Seitz., filed, US Patent Issued, 2018.

Sensor Fusion Interface for Multiple Sensor Input, **A. Sankar**, W. Portnoy., US Patent Issued, 2016.

Experience Streams for Rich Interactive Narratives, J. Joy, N. Datha, E. Stollnitz, **A. Sankar**, V. Krishnaswamy, S. Warriar, K. Rajanna, T. Joshi., US Patent Issued, 2015.

Generalized Interactive Narratives, **A. Sankar**, J. Joy, A. Prasad, N. Datha., US Patent Issued, 2011.

Selected Invited Talks

Apple Inc., Seattle, WA, *Interactive In-situ Scene Capture*, April, 2019.

Zillow Group, Seattle, WA, *Real-time Scene Capture on Mobile Devices*, February, 2018.

Apple Inc., Cupertino, CA, *Indoor Scene modeling on iPhone*, December, 2017.

UIST 2017, Quebec, QC, Canada, *Interactive Room Capture on 3D-Aware Mobile Devices*, October, 2017.

Univeristy of Washington, Seattle, WA, *Interactive In-Situ Scene Capture on Mobile Devices, PhD Thesis Defense*, September, 2017.

MobileHCI 2016, *In-situ semantic 3D modeling, Doctoral Consoritum talk*, September, 2016.

MobileHCI 2016, *In-situ CAD Capture*, September, 2016.

UIST 2012, *Capturing Indoor Scenes with Smartphones*, October, 2012.

ECCV 2012, *Being John Malkovich, as Poster*, December, 2010.

Microsoft Live Labs, Seattle, WA, USA, *India Digital Heritage Project*, August, 2008.

Microsoft TechVista, Chennai, India, *India Digital Heritage Project and Demo*, July, 2008.

Teaching

CSE481V: VR/AR Capstone, 2018 – Instructor, mentored six VR/AR project teams.

CSE481V: VR/AR Capstone, 2016 – Head Teaching Assistant for first VR/AR Class at UW CSE.

CSE557: Computer Graphics, 2015 – Teaching Assistant for graduate computer graphics course.

CSE557: Computer Graphics, 2014 – Teaching Assistant for graduate computer graphics course.

Skills

Languages C-family (C, C++, C#, Obj-C), Python, Swift

Scripting and Markup HTML, CSS, JavaScript, LaTeX

Frameworks Unity3D, ARKit, Cocoa, .NET, OpenGL, TensorFlow, MySQL, ASP, JSP

Design Sketch, Photoshop, Premiere, UIKit, Blender

Service, Awards & Personal

Academic Panel Participant: NSF NeTS, NASA SSERVI, Program Committees of CVPR, ICMI.

Regular peer reviewer for publications: TPAMI, SIGCHI, UIST, Mobile HCI, ISMAR, CVPR, DIS, ICMI.

UW C4C Invents Award, for contribution to technology commercialization, 2014.

Madrona Prize Winner, for research with best commercial potential, 2013.

Accenture Best Consumer Product Prize, UW Business Plan Competition, 2013.

Gold Medalist (Science), Sanskriti School, in the Grade 12 Standardized High-School Examinations

Student Volunteer, CSCW Conference 2012.

Volunteer at HEALTH Inc. and Sahaj (social non-profits in rural India).

Interested in entrepreneurship and real world impact of research. Avid hiker, biker, and mountaineer.