

SAHIL NARANG

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EDUCATION

University of North Carolina at Chapel Hill *Jan 2015 - May 2018 (expected)*
Ph.D. student in Computer Science
Advisor: Professor Dinesh Manocha

University of North Carolina at Chapel Hill *Aug 2013 - Dec 2014*
M.S. in Computer Science
Advisor: Professor Dinesh Manocha

GGSIIP University, New Delhi, India *Aug 2009 - May 2013*
B.Tech. in Computer Science & Engineering
Grade: 78.6 %
First Division with Distinction

RESEARCH

Current research focus is on developing efficient motion models for multi-agent navigation, including dynamics-aware motion models for navigation of autonomous vehicles, as well as efficient and accurate pedestrian motion synthesis. My research spans several areas including motion planning, multi-agent navigation, autonomous driving simulation, crowd simulation, & virtual reality.

PUBLICATIONS

Sahil Narang, Andrew Best, Dinesh Manocha, “*Simulating Movement Interactions between Avatars & Agents in Virtual Worlds using Human Motion Constraints*”, IEEE VR, 2018 (To Appear).

Sahil Narang, Andrew Best, Ari Shapiro, Dinesh Manocha, “*Generating Virtual Avatars with Personalized Walking Gaits using Commodity Hardware*”, ACM Multimedia, Proceedings of Thematic Workshops, 2017.

Andrew Best, **Sahil Narang**, Lucas Pasqualin, Daniel Barber, Dinesh Manocha, “*AutonoVi-Sim: Autonomous Vehicle Simulation Platform with Weather, Sensing, and Traffic control*”, Neural Information Processing Systems (NIPS) Workshop 2017.

Andrew Best, **Sahil Narang**, Daniel Barber, Dinesh Manocha, “*AutonoVi: Autonomous Vehicle Planning with Dynamic Maneuvers and Traffic Constraints*”, IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2017.

Sahil Narang, Andrew Best, Andrew Feng, Sin-hwa Kang, Dinesh Manocha, Ari Shapiro, “*Motion Recognition of Self & Others on Realistic 3D Avatars*”, Computer Animation & Virtual Worlds, 2017.

Sahil Narang, Andrew Best, Dinesh Manocha, “*Interactive Simulation of Local Interactions in Dense Crowds using Elliptical Agents*”, Journal of Statistical Mechanics: Theory and Experiment, 2017.

Sahil Narang, Andrew Best, Tanmay Randhavane, Ari Shapiro, Dinesh Manocha, “*PedVR: Simulating Gaze-Based Interactions between a Real User and Virtual Crowds*”, The ACM Symposium on Virtual Reality Software and Technology (VRST), 2016.

Andrew Best, **Sahil Narang**, Dinesh Manocha, “*Interactive and Conservative Collision Avoidance for Elliptical Agents*”, The International Conference on Robotics and Automation (ICRA), 2016.

Liang He, Jia Pan, **Sahil Narang**, Dinesh Manocha, “*Dynamic group behaviors for interactive crowd simulation*”, Eurographics/ ACM SIGGRAPH Symposium on Computer Animation (SCA) 2016.

Chonhyon Park, Andrew Best, **Sahil Narang**, Dinesh Manocha, “*Simulating High-DOF Human-like Agents using Hierarchical Feedback Planner*”, The ACM Symposium on Virtual Reality Software and Technology (VRST), 2015.

Sahil Narang, Andrew Best, Sean Curtis, Dinesh Manocha, “*Generating Pedestrian Trajectories Consistent with the Fundamental Diagram based on Physiological and Psychological Factors*”, PLoS ONE 2015.

Andrew Best, **Sahil Narang**, Sean Curtis, Dinesh Manocha, “*DenseSense: Interactive Crowd Simulation using Density-Dependent Filters*”, Eurographics/ ACM SIGGRAPH Symposium on Computer Animation (SCA) 2014, pp. 97-102.

DN Verma, **Sahil Narang**, Bhawna Juneja, “*Texture Based Image Retrieval using Correlation on Haar Wavelet Transform*”, Third International Conference on Advances in Communication, Network, and Computing (CNC) 2012, LNICST Vol. 108 (81-86).

EXPERIENCE

UNC-CH Jan 2015 - Present
Graduate Research Assistant, GAMMA group Chapel Hill, NC

- Advised by Prof. Dinesh Manocha
- Developing immersive models for user-virtual agent interactions in VR.
- Developing motion planning algorithms for autonomous vehicles.
- Research in crowd simulation and multi-agent navigation.

Institute for Creative Technologies, USC May 2015 - Aug 2015 & May 2016 - Aug 2016
Visiting Research Assistant Los Angeles, CA

- Worked with the SmartBody team under the guidance of Dr Ari Shapiro.
- Focused on designing controllable models of locomotion for virtual humans.
- Studied factors affecting perception of motion rendered on virtual avatars in terms of recognition.
- Developed novel algorithm for synthesizing personalized gaits for new users.

Amazon May 2014 - July 2014
Software Development Engineer Intern Seattle, WA

- Worked for the Inventory Placement Optimization team on replacing their existing visualizer with a more scalable solution.
- Designed and deployed a visualizer with a distributed multi-threaded architecture capable of processing 18 Gb of data in one minute, 50 times faster than its predecessor.

UNC-CH Aug 2013 - May 2014
Graduate Teaching Assistant Chapel Hill, NC

- Tutored students and graded COMP 116 (Intro. to scientific programming).

Technical University of Berlin May 2012 - Aug 2012
Summer Intern Berlin, Germany

- Worked for the Neural Information Processing group.
- Collaborated on developing a recognition system that is largely scale-, illumination-, orientation-invariant and can be used on any object regardless of its shape or size.
- Developed system is capable of recognizing objects in a cluttered scene in almost real time.

Defence Research & Development Org. (DRDO)

Summer Intern

May 2011 - Aug 2011

New Delhi, India

- Worked for the Defence Terrain Research Lab on object detection and recognition in satellite images.
- Developed CTD, a unique feature descriptor for colour image retrieval and browsing.
- Achieved higher retrieval accuracy compared to commonly used Gradient-based methods that use Sobel Operator & GLCM.

TECHNICAL STRENGTHS

Programming (Proficient)	C/C++ (VC, gcc, icc), Java, MATLAB, Python
Programming (Familiar)	C#, HTML/XML, MySQL, AspectJ, VHDL, Spring Framework
API/Toolkits/Etc.	OpenMP, MPI, OpenGL, ROS, OpenCV, PCL, FLANN, BOOST, TinyXML, Lombok SVN, Git, AWS (EC2 & S3)
Development Environments	Eclipse based IDEs, Visual Studio, MATLAB, Unity 4, Unreal Engine 4
Operating Systems	Windows, Linux

CONFERENCE PRESENTATIONS & TALKS

- Presented technical papers at ICRA 2016, CASA 2017, ACM MM 2017, IEEE VR 2018 (expected).
- Delivered guest lectures on “Autonomous Driving” at Indian Institute of Technology, Delhi.
- Co-instructed advanced graduate course on “Multi-Agent Simulation for Crowds and Autonomous Driving” at UNC Chapel Hill.
- Presented research results to funding sources, UNC faculty.

SELECTED ADVANCED COURSEWORK

Robot Motion Planning, Big Data, Computational Geometry, Physically-based Modeling & Simulation, Sound Simulation, Artificial Intelligence, Parallel Computing, Exploring Virtual Worlds

REFERENCES

Available upon request