

# Numair Khan

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<b>RESEARCH</b>	My research focuses on methods and representations for scene reconstruction, differentiable rendering, and novel-view synthesis.	
<b>EDUCATION</b>	<b>Brown University</b> , Providence, RI PhD in Computer Science, with Prof. James Tompkin <i>Thesis</i> : Finding a Sparse Complete Set for Plenoptic and Scene Reconstruction. MS in Computer Science	2016 – 2022 2016 – 2018
	<b>Courant Institute, New York University</b> , New York, NY MS in Computer Science, with Prof. Ken Perlin <i>Master’s Thesis</i> : Multi-level Procedural Terrain Rendering	2012 – 2014
	<b>Lahore University of Management Sciences</b> , Lahore, Pakistan BSc (Honors) in Computer Science	2005 – 2009
<b>ACADEMIC AWARDS</b>	Brown Graduate School Fellowship Fulbright Scholarship NYU Master’s Thesis Research Fellowship	2016 – 2017 2012 – 2014 2013
<b>PUBLICATIONS: CONFERENCES</b>	<b>N. Khan</b> , M. H. Kim, and J. Tompkin, “Differentiable Diffusion for Dense Depth Estimation from Multi-view Images,” <i>Computer Vision and Pattern Recognition (CVPR)</i> , Jun 2021. <b>N. Khan</b> , M. H. Kim, and J. Tompkin, “Edge-aware Bidirectional Diffusion for Dense Depth Estimation from Light Fields,” <i>British Machine Vision Conference (BMVC)</i> , Nov 2021. <b>N. Khan</b> , M. H. Kim, and J. Tompkin, “View-Consistent 4D Light Field Depth Estimation,” <i>British Machine Vision Conference (BMVC)</i> , Apr 2020. <b>N. Khan</b> , Q. Zhang, L. Kasser, H. Stone, M. H. Kim, and J. Tompkin, “View-Consistent 4D Light Field Superpixel Segmentation,” <i>International Conference on Computer Vision (ICCV)</i> , Nov 2019. (Oral Presentation) M. Nasim, A. Rextin, <b>N. Khan</b> , and M. Malik, “Understanding Call Logs of Smartphone Users for Making Future Calls,” <i>Proc. 18th International Conference on Human-Computer Interaction with Mobile Devices and Services (MobileHCI’16)</i> , ACM, New York, pp. 483–490, Sep 2016.	
<b>PUBLICATIONS: JOURNALS</b>	<b>N. Khan</b> , and A. Rahman, “Rethinking the Mini-Map: A Navigational Aid to Support Spatial Learning in Urban Game Environments,” <i>International Journal of Human-Computer Interaction</i> 34(12), pp. 1135–1147, Dec 2017. M. Nasim, A. Rextin, S. Hayat, <b>N. Khan</b> , and M. Malik, “Data Analysis and Call Prediction on Dyadic Data from an Understudied Population,” <i>Pervasive and Mobile Computing</i> 41, pp. 166–178, Oct 2017.	
<b>PUBLICATIONS: WORKSHOPS</b>	<b>N. Khan</b> , and M. Zahran, “Space-Efficient Pointwise Computation of the Distance Transform on GPUs,” <i>2017 IEEE International Parallel and Distributed Processing Symposium Workshops (IPDPSW)</i> , pp. 557–566, May 2017.	
<b>PATENTS</b>	“High-Definition Real-time View Synthesis,” (pending) U.S. Patent Application No. 63/237,850. Date of application: Sep 1, 2020.	

<b>INDUSTRY EXPERIENCE</b>	<b>Research Intern</b> , Snap Inc.	Jun 2021–Aug 2021	
	<ul style="list-style-type: none"> <li>- Developed an efficient Multi-Plane Image (MPI) representation for view synthesis at &gt;1080p and 140 FPS.</li> <li>- Worked with Prof. Shree Nayar, Director of Research at the Computational Imaging Lab.</li> </ul>		
	<b>Research Intern</b> , Samsung Research America	Mar 2021–May 2021	
	<ul style="list-style-type: none"> <li>- Developed a method for perspective undistortion of selfie photos using a stereo camera.</li> <li>- Trained facial reconstruction from distorted images by observing how 3DMM faces distort a real-world dataset.</li> </ul>		
	<b>Founder/Mobile Game Developer</b> , The Kinematic Laboratory	Mar 2010–Apr 2012	
<ul style="list-style-type: none"> <li>- Released six game titles on the iPhone App Store.</li> <li>- Developed <i>Flood Rescue</i>, a game which became the highest ranked app in Pakistan, the second-highest ranked app in India, and a top-ten app in four other countries.</li> </ul>			
	<b>Mobile Game Developer</b> , Tintash Inc., Pakistan	Jul 2009 – Mar 2010	
	<ul style="list-style-type: none"> <li>- Developed level designer for the iPhone game <i>Super Slyder</i>.</li> <li>- Led development on two additional iPhone games.</li> </ul>		
	<b>Software Developer</b> , Techlogix Pvt. Ltd, Pakistan	Sep 2009–Mar 2010	
<ul style="list-style-type: none"> <li>- Gained experience developing enterprise software as part of a global team.</li> <li>- Led the integration phase in the deployment of Oracle’s FLEXCUBE service for a national bank.</li> </ul>			
<b>OPEN-SOURCE SOFTWARE</b>	Light Field Superpixel Segmentation	<a href="https://github.com/brownvc/lightfieldsuperpixels">https://github.com/brownvc/lightfieldsuperpixels</a>	
	Light Field Depth Estimation	<a href="https://github.com/brownvc/lightfielddepth">https://github.com/brownvc/lightfielddepth</a>	
	Differentiable Diffusion for Dense Depth Estimation	<a href="https://github.com/brownvc/diffdiffdepth">https://github.com/brownvc/diffdiffdepth</a>	
<b>INVITED TALKS</b>	“View-Consistent Light Field Superpixels,” at the Korean Advanced Institute of Science and Technology (KAIST), Oct 2019.		
	“Augmented Reality for Learning and Education,” The 11th Annual Fulbright and Humphrey Alumni Conference, Lahore, Pakistan. Dec 2014.		
<b>MAGAZINE ARTICLES</b>	<b>N. Khan</b> , “In Search of a Strategy Against Misinformation,” <i>ACM XRDS</i> 27(1), pp. 8–9, 2020.		
	<b>N. Khan</b> , A. Penu, T. Dickerson, L. Liukas, C. Jung-Harada, S. Bhattacharya, “I, Entrepreneur,” <i>ACM XRDS</i> 23(4), pp. 50–53, 2017.		
	<b>N. Khan</b> , “The Essentials of a Computer Scientist’s Toolkit,” <i>ACM XRDS</i> 21(2), pp. 9–9, 2014.		
<b>SKILLS</b>	<b>Programming</b> C/C++, Java, C# Python, MATLAB, Objective-C, JavaScript	<b>APIs/SDKs</b> PyTorch, Keras, TensorFlow, CUDA, OpenCV, OpenGL	<b>Software</b> Unity3D, Maya, Photoshop, Premiere
<b>RELEVANT COURSEWORK</b>	Advanced Computer Vision Machine Learning Linear Algebra Multicore Programming	Advanced Computer Graphics Deep Learning Advanced Probability GPU Programming	Motion Capture for Movies & Games Convex Optimization Numerical Methods
<b>TEACHING EXPERIENCE</b>	<b>Teaching Assistant</b> , Brown University Computational Photography Advanced Computer Graphics	Fall 2018, Fall 2020 Spring 2018	

	<b>Visiting Faculty</b> , National University of Science and Technology, Pakistan	
	Advanced Programming	Spring 2016
	Operating Systems	Fall 2015
	<b>Grader</b> , New York University	
	Fundamental Algorithms	Fall 2013
	<b>Volunteer Tutor</b> , SOS Village, Rawalpindi, Pakistan	
	High school mathematics and physics	Nov 2014 – Apr 2015
<b>TEACHING DEVELOPMENT</b>	<b>Certificate I: Reflective Teaching</b>	May 2018
	Sheridan Center for Teaching, Brown University	
	<b>Certificate II: Course Design</b>	May 2019
	Sheridan Center for Teaching, Brown University	
<b>MENTORING</b>	Undergraduate, James Washington, Morehouse College	2021
	Masters, Kanchita Klangboonkrong, Brown University	2021
	PhD, Abdul Mannan, Brown University	2021
	PhD, Ghulam Murtaza, Brown University	2019
	PhD, Charles Lovering, Brown University	2018
	High School Senior, Jarrod Hill, North Smithfield High School, Rhode Island, USA	2018
	High School Senior, Lauren Cenedella, North Smithfield High School, Rhode Island, USA	2017
<b>SERVICE</b>	Reviewer, International Conference on 3D Vision (3DV)	2021
	Reviewer, IEEE Transactions on Computational Imaging	2021
	Feature Editor, ACM Crossroads (XRDS) magazine,	2014–2021
	Reviewer, Pacific Graphics	2020
	Lead Editor, ACM XRDS:CrossRoads, Volume 27, No. 1	2020
	Lead Editor, ACM XRDS:CrossRoads, Volume 25, No. 1	2018
	Judge at the North Smithfield High School senior project presentations	2018
	Lead Editor, ACM XRDS:CrossRoads, Volume 23, No. 4	2017
	Lead Editor, ACM XRDS:CrossRoads, Volume 22, No. 3	2016
	Member of the interview panel for the USEFP global undergraduate exchange program	2015
<b>LEADERSHIP ACTIVITIES</b>	Completed Brown University's Effective Communication Workshop.	
	Completed Block-I of Brown University's Conflict Resolution Workshop.	
	Represented Pakistan at the 65th Student Conference on US Affairs (SCUSA) at the US Military Academy at West Point, New York.	
	Volunteered at the United Nations Headquarters to support the Global Initiative on Education.	
	Volunteered at the SOS Village in Rawalpindi, Pakistan to teach STEM subjects to high school students.	