

# Rahul Arora

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<b>CONTACT INFORMATION</b>	DGP Lab, Bahen Centre for IT University of Toronto, Toronto ON M5S 2E4	arorar@dgp.toronto.edu dgp.toronto.edu/~arorar
<b>RESEARCH INTERESTS</b>	Interactive Computer Graphics Human-Computer Interaction Virtual and Augmented Realities	
<b>EDUCATION</b>	<p><b>PhD, University of Toronto</b> 2015-Present Major: Computer Science Thesis: Creative Expression in Immersive 3D Environments (Tentative title) Adviser: Prof. Karan Singh CGPA: 4.0/4.0</p> <p><b>MTech, Indian Institute of Technology, Kanpur</b> 2014-2015 Major: Computer Science and Engineering Thesis: Exploring Design Space by Interpolating between Multiple Sketches Advisers: Prof. Vinay P. Namboodiri and Dr. Adrien Bousseau CGPA: 9.6/10.0</p> <p><b>BTech, Indian Institute of Technology, Kanpur</b> 2010-2015 Major: Computer Science and Engineering CGPA: 8.5/10.0</p>	
<b>PEER-REVIEWED PUBLICATIONS</b>	<p><b>CASSIE: Curve and Surface Sketching in Immersive Environments</b> Emilie Yu, <b>Rahul Arora</b>, Tibor Stanko, J. Andreas Bærentzen, Karan Singh, Adrien Bousseau <i>ACM SIGCHI Conference on Human Factors in Computing Systems 2021 (CHI '21), Conditionally Accepted</i></p> <p><b>MagicalHands: Mid-Air Hand Gestures for Animating in VR</b> <b>Rahul Arora</b>, Rubaiat Habib Kazi, Danny Kaufman, Wilmot Li, and Karan Singh <i>ACM Symposium on User Interface Software and Technology 2019 (UIST '19)</i> <a href="https://www.dgp.toronto.edu/projects/magical-hands/">https://www.dgp.toronto.edu/projects/magical-hands/</a></p> <p><b>Volumetric Michell Trusses for Parametric Design &amp; Fabrication</b> <b>Rahul Arora</b>, Alec Jacobson, Timothy R. Langlois, Yijiang Huang, Caitlin Mueller, Wojciech Matusik, Ariel Shamir, Karan Singh, and David I.W. Levin <i>ACM Symposium on Computational Fabrication 2019 (SCF '19)</i> <a href="https://www.dgp.toronto.edu/projects/michell/">https://www.dgp.toronto.edu/projects/michell/</a></p> <p><b>SymbiosisSketch: Combining 2D and 3D Sketching for Designing Detailed 3D Objects in Situ</b> <b>Rahul Arora</b>, Rubaiat Habib Kazi, Tovi Grossman, George Fitzmaurice, and Karan Singh <i>ACM SIGCHI Conference on Human Factors in Computing Systems 2018 (CHI '18)</i> <a href="https://doi.org/10.1145/3328939.3328999">https://doi.org/10.1145/3328939.3328999</a></p>	

### Experimental Evaluation of Sketching on Surfaces in VR

**Rahul Arora**, Rubaiat Habib Kazi, Fraser Anderson, Tovi Grossman, Karan Singh, and George Fitzmaurice

*ACM SIGCHI Conference on Human Factors in Computing Systems 2017 (CHI '17)*

<http://dx.doi.org/10.1145/3025453.3025474>

### SketchSoup: Exploratory Ideation using Design Sketching

**Rahul Arora**, Ishan Darolia, Vinay P. Nambodiri, Karan Singh, and Adrien Bousseau

*Computer Graphics Forum (CGF) 2017, presented at Eurographics 2017*

<http://dx.doi.org/10.1111/cgf.13081>

### Derandomizing Isolation Lemma for $K_{3,3}$ -free and $K_5$ -free Bipartite Graphs

**Rahul Arora**, Ashu Gupta, Rohit Gurjar, and Raghunath Tewari

*Symposium on Theoretical Aspects of Computer Science (STACS) 2016*

<http://dx.doi.org/10.4230/LIPIcs.STACS.2016.10>

## OTHER PUBLICATIONS

### Sketching in 3D Space (Invited Book Chapter)

Mayra Donaji Barrera Machuca, **Rahul Arora**, Philipp Wacker, Johann Habakuk Israel, and Daniel Keefe

*In Interactive Sketch-Based Interfaces and Modelling for Product Design (ed. Alexandra Bartolo). River Publishers. In press.*

### Mid-Air Drawing of Curves on 3D Surfaces in AR/VR (Preprint)

**Rahul Arora** and Karan Singh

*arXiv preprint*

<https://arxiv.org/abs/2009.09029>

### Creative Expression with Immersive 3D Interactions (Juried)

**Rahul Arora**

*Extended Abstracts of the 2020 CHI Conference on Human Factors in Computing Systems (CHI '20 Doctoral Consortium)*

<https://dl.acm.org/doi/10.1145/3334480.3375028>

### Designing Volumetric Truss Structures for Computational Fabrication (Juried)

**Rahul Arora**, Alec Jacobson, Timothy R. Langlois, Karan Singh, and David I.W. Levin

*Graphics Interface 2018 Posters (GI '18)*

<https://bit.ly/31CTjtw>

## AWARDS AND RECOGNITION

Robert C. Lansdale/Okino Computer Graphics Fellowship: CA \$4,000	2020
Wolfond Scholarship in Wireless Information Technology: CA \$10,000	2019
UofT Libraries Grad Exhibit Competition (3 winners): CA \$1,000	2019
Adobe Research Fellowship 2019 (11 fellows): US \$10,000	2018
Adobe Research Fellowship 2018 Finalist	2017
Mitacs Accelerate Award for industrial partnership: CA \$15,000	2016
Merit-cum-Means Scholarship, IIT Kanpur: Full tuition amount	2010–2014
Academic Excellence Award, IIT Kanpur (top 5% students)	2013

<b>INTERNSHIPS</b>	<b>Adobe Research, Seattle, USA</b> <i>with Timothy Langlois, Danny Kaufman, and Rubaiat Habib</i> Worked on techniques for creating stylized animations of 2D fluids.	Summer 2019
	<b>Adobe Research, Seattle, USA</b> <i>with Rubaiat Habib, Danny Kaufman, and Wil Li</i> Studied gestural methods for authoring animations in VR.	Summer 2018
	<b>Autodesk Research, Toronto, Canada</b> <i>with Tovi Grossman and Rubaiat Habib</i> Developed an augmented reality tool for 3D concept sketching.	Winter 2017
	<b>Autodesk Research, Toronto, Canada</b> <i>with Tovi Grossman and Rubaiat Habib</i> Conducted lab experiments to understand 3D sketching ability.	Summer 2016
	<b>Inria, Sophia-Antipolis, France</b> <i>with Adrien Bousseau</i> Developed a user-guided method for ideation sketch interpolation.	Summer 2014
	<b>Adobe Research, Bangalore, India</b> <i>with Ramesh Srinivasaraghavan</i> Built a gamified crowdsourcing platform for object recognition tasks.	Summer 2013
<b>TEACHING EXPERIENCE</b>	<b>Computer Graphics</b> , University of Toronto Teaching Assistant for Prof. Alec Jacobson	Fall 2019
	<b>Computer Graphics</b> , University of Toronto Teaching Assistant for Prof. David Levin	Winter 2019
	<b>Computer Graphics</b> , University of Toronto Teaching Assistant for Prof. Karan Singh and Prof. David Levin	Winter 2018
	<b>Computer Graphics</b> , University of Toronto Teaching Assistant for Prof. Karan Singh and Prof. Alec Jacobson	Fall 2017
	<b>Intro to Theory of Computation</b> , University of Toronto Teaching Assistant for Prof. Azadeh Farzan	Fall 2015
	<b>Introduction to Computer Graphics</b> , IIT Kanpur Teaching Assistant for Prof. Vinay P. Namboodiri	Fall 2014
<b>ACTIVITIES</b>	<b>Committee Member</b> for SIGGRAPH Asia 2021 XR Program.	
	<b>Area Chair</b> for Graphics Interface (GI) 2020.	
	<b>Student Volunteer</b> at User Interface Software and Technology (UIST) 2019.	
	<b>Reviewer</b> for computer graphics conferences:	
	SIGGRAPH	2020
	SIGGRAPH Asia	2020

Graphics Interface (GI)	2018, 2020
<b>Reviewer</b> for computer graphics journals:	
Computer Graphics Forum (CGF)	2020
Transactions on Visualization and Computer Graphics (TVCG)	2019–2020
Computer-Aided Design (CAD)	2019
Computer & Graphics	2019
Computer Graphics & Applications	2017
<b>Reviewer</b> for HCI conferences:	
Conference on Human Factors in Computing Systems (CHI)	2017–2021
User Interfaces Software and Technology (UIST)	2018–2020
Designing Interactive Systems (DIS)	2018
Graphics Interface (GI)	2020
<b>Reviewer</b> for specialized AR/VR conferences	
Virtual Reality (IEEE VR)	2018, 2020, 2021
Virtual Reality Software and Technology (VRST)	2020
International Symposium on Mixed and Augmented Reality (ISMAR)	2020
Spatial User Interaction (SUI)	2017
<b>Reviewer</b> for other venues	
Springer Nature Applied Sciences (SNAS)	2019

## REFERENCES

<b>Karan Singh</b> Professor, University of Toronto	karan@dgp.toronto.edu
<b>David IW Levin</b> Assistant Professor, University of Toronto	diwlevin@cs.toronto.edu
<b>Tovi Grossman</b> Assistant Professor, University of Toronto Distinguished Visiting Scientist, Autodesk	tovi@dgp.toronto.edu
<b>Rubaiat Habib Kazi</b> Senior Research Scientist, Adobe	rubaiat@adobe.com
<b>Adrien Bousseau</b> Researcher, Inria Sophia-Antipolis	adrien.bousseau@inria.fr
<b>Timothy R Langlois</b> Senior Research Scientist, Adobe	tlangloi@adobe.com
<b>Wilmot Li</b> Principal Scientist, Adobe	wilmotli@adobe.com
<b>Danny M Kaufman</b> Senior Research Scientist, Adobe	kaufman@adobe.com
<b>Alec Jacobson</b> Assistant Professor, University of Toronto	jacobson@cs.toronto.edu