Sarah Kushner

PhD student · Computer graphics, Human computer interaction, Fabrication

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Education

University of Toronto *Toronto, ON, Canada*

PhD in Computer Science – Geometry, Animation & Fabrication *September 2017 - October 2024*

Advised by Daniel Wigdor and Paul H. Dietz
Thesis: *Techniques for Physical Storytelling*

Institut polytechnique de Grenoble (Grenoble INP) *Grenoble, France*

MS in Informatics – Graphics, Vision & Robotics Specialty *September 2016 - June 2017*

Advised by Marie-Paule Cani and Rémi Ronfard
Thesis: *The Sketch-Based Posing and Animation of Multiple Characters: Animation of Dancing Couples*

Drexel University *Philadelphia, PA, USA*

BS in Computer Science, Minor in Digital Media *September 2012 - June 2016*

Magna Cum Laude
Pennoni Honors College

Experience

University of California, Santa Barbara *Santa Barbara, CA, USA*

Postdoctoral Researcher in the Geometric Intelligence Lab *January 2025 - December 2025*

To begin in January 2025, working on visualization and deep learning based shape analysis of 3D women's brain data

University of California, Santa Barbara *Santa Barbara, CA, USA*

Visiting PhD student in the Geometric Intelligence Lab *October 2022 - March 2023*

Project on interpolating 3D rigged animations on $SO(3)$ using geometric statistics

Inria Grenoble Rhône-Alpes *Montbonnot-Saint-Martin, France*

Research Intern (Stagiaire) *February 2017 - June 2017*

Project on sketch-based animation techniques and numerical methods to animate multiple characters

Drexel University *Philadelphia, PA, USA*

Research Assistant *March 2015-August 2015*

Project on designing a course on Knowledge Representation and Reasoning and Privacy

Applied Informatics Group *Philadelphia, PA, USA*

Research Software Engineer Co-op *September 2014 - March 2015*

Project on building a robust intelligent system to answer cybersecurity queries

Publications, Posters & Demos

Papertronic Puppets: Teaching STEM and Storytelling Through Creative Construction *Washington D.C., USA*

IEEE Frontiers in Education (FIE) *October 2024*

Sarah Kushner, John Kanji, Paul H. Dietz, Daniel Wigdor

Interpolation of Animated Characters on Lie groups

Technical Report *March 2023*

Sarah Kushner, Vismay Modi, Nina Miolane

Interactive 3D Zoetrope with a Strobing Flashlight (Demo) *Bend, OR, USA*

User Interface Software and Technology (UIST) *October 2022*

Sarah Kushner, Paul H. Dietz, Alec Jacobson

Levitating Rigid Objects with Hidden Rods and Wires *Vienna, Austria (remote)*

Eurographics *May 2021*

    Sarah Kushner, Risa Ulinski, Karan Singh, David I.W. Levin, Alec Jacobson

Example-Based Print Preview for Laser Cutting (Poster) *Toronto, ON, Canada*

Graphics Interface *May 2018*

    Sarah Kushner, Alec Jacobson

Ontology-Driven Data Semantics Discovery for Cyber-Security (Poster) *Harrisburg, PA, USA*

Undergraduate Research at the Capitol *April 2016*

    Sarah Kushner, Marcello Balduccini

Ontology-Driven Data Semantics Discovery for Cyber-Security *Portland, OR, USA*

Practical Aspects of Declarative Languages *June 2015*

    Marcello Balduccini, Sarah Kushner, Jacquelin Speck

Talks

Techniques for Physical Storytelling *Denver, Colorado, USA*

WiGraph Rising Stars Research Pitch *July 2024*

Blender Tutorial & Interpolation of Animated Characters on Lie groups *Santa Barbara, California, USA*

Geometric Intelligence Lab *January 2023*

Zoetrope Cinematography and the Timing Animation Principles *Santa Barbara, California, USA*

Geometric Intelligence Lab *October 2022*

Fabricating Cinematography Techniques for 3D Printed Movies *Vienna, Austria (remote)*

Eurographics Doctoral Consortium *May 2021*

Levitating Rigid Objects with Hidden Rods and Wires *Toronto, ON, Canada*

Toronto Geometry Colloquim *April 2021*

Levitating Rigid Objects with Hidden Rods and Wires *Toronto, ON, Canada*

University of Toronto Graphics Club Rapid Fire Talks *March 2021*

Sneakily Staging Structually Sound Supports *Waterloo, ON, Canada*

Montreal Toronto Graphics Workshop *November 2019*

Invisible Supports for 3D Zoetrope Movies *Montréal, QC, Canada*

Montreal Toronto Graphics Workshop *November 2018*

Realistic Example-Based Print Preview for Laser Cutting *Toronto, ON, Canada*

Montreal Toronto Graphics Workshop *November 2017*

Teaching

CSC 490 - Capstone Physical Computing in K-12 Education *University of Toronto*

Course Instructor *Winter 2024*

Asisst students with weekly assignments and mentor them through their capstone projects

CSC 317/2504 - Computer Graphics *University of Toronto*

Course Instructor *Summer 2020*

Taught the fourth year undergraduate graphics course remotely to ~70 students

CSC 419/2520 - Geometry Processing
University of Toronto

TEACHING ASSISTANT
Winter 2020

Lead tutorial sessions to asisst students with homework assignments, marked assignments and final projects

CSC 2521 - Topics in Computer Graphics: Seminar on Geometry and Animation
University of Toronto

TEACHING ASSISTANT, SUBSTITUTE LECTURER
Fall 2019

Lead discussions on seminal research papers in graphics, assign marks for participation and quality

CSC 317/2504 - Computer Graphics
University of Toronto

TEACHING ASSISTANT, SUBSTITUTE LECTURER
Winter 2018 - Winter 2020

Provided guidance to students working on the assignments, marked assignments and exams

CSC 320 - Introduction to Visual Computing
University of Toronto

TEACHING ASSISTANT
Winter 2018

Created marking schemes, marked assignments and exams

CSC 318 - Interactive Computational Media
University of Toronto

TEACHING ASSISTANT
Fall 2017

Created marking schemes, marked assignments and exams

Honors and Awards

Postdoctoral Researcher Award
UC Santa Barbara

RECEIVED, $73,500 USD
2025

Ann S. Bowers Women's Brain Health Initiative to apply cutting-edge AI to advance women's brain health

WiGRAPH Rising Stars Program
WiGRAPH

RECEIVED, SIGGRAPH CONFERENCE FEES FOR 2023 AND 2024
2023

Designed to encourage people of underrepresented genders to become research leaders in computer graphics

Mitacs Globalink Research Award
Mitacs

RECEIVED, $6000 CAD
2022

Supports research collaborations with partner university to conduct a 12- to 24-week research project

Beatrice Worsley Graduate Scholarship in Computer Science
University of Toronto

RECEIVED, $4000 CAD
2018

Awarded to PhD students who have taken an active role in helping to promote women in the field of computer science

Grenoble INP Fondation Bourse d'Excellence Internationale
Grenoble INP

RECEIVED, €5000 EUR
2016/2017

Attract talented international students with strong academic and professional potential to engineering training at Grenoble INP

Fulbright Study/Research Fellowship
Fulbright U.S. Student Program

SEMI-FINALIST
2016/2017

Study/research grant to design a project to work on with advisers at foreign universities

James B. Maginnis Award
Drexel University

RECEIVED, $500 USD
Winter 2016

Presented to an upper division student majoring in computer science in recognition of academic excellence

SuperNova Undergraduate Research Fellow
Drexel University

RECEIVED
2016

Engaged in progressively demanding undergraduate research experiences, courses and projects

Franklin Institute Laureate Liaison
Franklin Institute, Drexel University

RECEIVED
Fall 2017

Liaison to visiting scholars (Edmund Clarke) recognized at the Franklin Institute

STAR Scholar Summer Research Program
Drexel University

RECEIVED, $4000 USD
2013

Students Tackling Advanced Research Program

Activities

LEADERSHIP

DCS Women   *University of Toronto*

STUDENT ORGANIZER   *September 2021 - August 2022*

  Helped organize and run events for graduate students in the Department of Computer Science

University of Toronto Department of Computer Science   *University of Toronto*

GRADUATE APPLICATION TRIAGER   *December 2021*

  16 hours of paid work on processing graduate school applications

Symposium on Geometry Processing Conference   *Toronto, ON (remote)*

STUDENT VOLUNTEER   *July 2021*

  Provided Zoom support, created and moderated the Discord server, and ran Trivia Night

HER CODE CAMP   *Affiliated with University of Toronto*

DIRECTOR OF MARKETING, DIRECTOR OF MENTORSHIP   *September 2019 - August 2020*

  Helped organize Python workshops to high school students in the Toronto area who are women or non-binary

MENTORING UNDERGRADUATES & HIGH SCHOOL STUDENTS

Graduate Application Assistance Program (GAAP)   *University of Toronto*

MENTOR   *October 2021 - October 2022*

  Advising undergraduate and masters students to improve their CVs and statements for grad school applications

Nikoleta Grujic   *University of Toronto*

ENGINEERING SCIENCE CAPSTONE MENTOR   *September 2023 - June 2024*

  Engineering science capstone project on audio in interactive zoetropes

Evelyn Pan   *University of Toronto*

COMPUTER SCIENCE RESEARCH MENTOR   *September 2023 - December 2023*

  Computer science capstone project on zoetrope kits for educational purposes

Anqi Li   *University of Toronto*

SUMMER PROJECT MENTOR   *April 2021 - August 2021*

  Mechanical engineering of large scale zoetropes

Cindy Zhu and Kevin Huang   *(visiting) Unionville High School*

MENTOR   *April 2018 - June 2020*

  Project on viewing meshes in VR
  Cindy is now studying computer science at Carnegie Mellon University

Arjun Chhabra   *University of Toronto*

ENGINEERING SCIENCE SUMMER PROGRAM MENTOR   *June 2018 - September 2018*

  Project on visualization tools for laser cutting
  Arjun is now a Mechanical and Aerospace Engineering PhD Student at Princeton University

Undergraduate Research Leaders   *Drexel University*

MENTOR   *September 2015 - June 2016*

  Guided undergraduate students who wanted to be involved in research

REVIEWING

Conference on Human Factors in Computing Systems (CHI)

2024

IEEE Frontiers in Education (FIE) Work in Progress Papers

2024

MEMBERSHIPS

ACM SIGGRAPH, Upsilon Pi Epsilon, University of Toronto DCS Women

Skills

Programming Languages

Python, C++, Matlab, HTML, CSS, Bash, LaTeX, Javascript

Software

3D Software: Blender, Autodesk Maya, Fusion 360, 3D printing slicers
2D Software: Adobe Photoshop, Illustrator, AfterEffects, Google Slides, Apple Keynote, iMovie, Microsoft PowerPoint, Excel, Word
iPad: ProCreate
IDEs: Visual Studio, Visual Studio Code, Arduino

Hardware

Machines: 3D printing, laser cutting, CNC milling
Electronics: Arduino, basic circuit design, LEDs, stepper motors, IR sensors/photo interrupters, inductive proximity sensors, triggerable cameras, servo motors
Building: Soldering, jigsaw, drill press, aluminum extrusion design and assembly

Art

Painting: watercolour, acrylic, silkscreen
Drawing: graphite, charcoal, chalk pastel
Digital: graphic design, iPad drawing, web design