

SILVIA SELLÁN

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EDUCATION

University of Toronto PhD in Computer Science <i>Supervisor: Alec Jacobson</i>	<i>2019 - Present</i>
University of Oviedo B.Sc. in Physics	<i>2015 - 2019</i>
University of Oviedo B.Sc. in Mathematics	<i>2014 - 2019</i>

EXPERIENCE

Adobe Inc. Research Intern <i>Mentored by Noam Aigerman and managed by Jovan Popovic</i>	<i>May 2020 - December 2020</i> <i>Toronto, Canada</i>
Adobe Inc. Research Intern <i>Mentored by Noam Aigerman and managed by Jovan Popovic</i>	<i>July 2019 - October 2019</i> <i>San Francisco, United States</i>
Fields Institute for Research in the Mathematical Sciences Undergraduate Research Intern <i>Supervised by Prof. Alec Jacobson</i>	<i>Summer 2018</i> <i>Toronto, Canada</i>
Fields Institute for Research in the Mathematical Sciences Undergraduate Research Intern <i>Supervised by Prof. Alec Jacobson</i>	<i>Summer 2017</i> <i>Toronto, Canada</i>
ICMAT (Institute of Mathematical Sciences) Grant Programme Severo Ochoa - Introduction to Research <i>Supervised by Prof. Javier Parcet</i>	<i>March 2017 - March 2018</i> <i>Madrid, Spain</i>

JOURNAL PUBLICATIONS

Breaking Good: Fracture Modes for Realtime Destruction Silvia Sellán , Jack Luong, Leticia Mattos Da Silva, Aravind Ramakrishnan, Yuchuan Yang, Alec Jacobson <i>TBD</i>	<i>2021</i>
Swept Volumes via Spacetime Numerical Continuation Silvia Sellán , Noam Aigerman, Alec Jacobson <i>ACM Transactions On Graphics (Proc. SIGGRAPH)</i>	
Opening and Closing Surfaces Silvia Sellán , Jacob Kesten, Ang Yan Sheng, Alec Jacobson <i>ACM Transactions On Graphics (Proc. SIGGRAPH Asia)</i>	<i>2020</i>
Developability of Heightfields via Rank Minimization Silvia Sellán , Noam Aigerman, Alec Jacobson <i>ACM Transactions On Graphics (Proc. SIGGRAPH)</i>	

Solid Geometry Processing on Deconstructed Domains

2019

Silvia Sellán, Herng Yi Cheng, Yuming Ma, Mitchell Dembowski, Alec Jacobson
Computer Graphics Forum (presented at Eurographics SGP 2019)

OTHER PUBLICATIONS

Blender for Geometry Processing Academic Papers

2022

Silvia Sellán

Course to be presented at the Symposium on Geometry processing (SGP)

An introduction to GP programming in MATLAB with gptoolbox

2021

Hsueh-Ti Derek Liu, Silvia Sellán, Oded Stein

Course presented at the Symposium on Geometry processing (SGP)

Efficient and Robust Swept Volumes

Silvia Sellán, Noam Aigerman, Alec Jacobson

Poster presented at the Vector Institute Research Symposium

Applications of Geometry Processing to Computer Graphics

2019

Silvia Sellán

B.Sc. in Mathematics thesis co-supervised by Alec Jacobson and Carlos Fernández García

An Introduction to Primal Inflation

Silvia Sellán

B.Sc. in Physics thesis supervised by Luigi Toffolatti

Solid Geometry Processing on Deconstructed Domains

2018

Silvia Sellán, Herng Yi Cheng, Yuming Ma, Mitchell Dembowski, Alec Jacobson

Poster presented at Eurographics SGP 2018

Solving PDEs on Overlapping Domains

Silvia Sellán, Herng Yi Cheng, Yuming Ma, Mitchell Dembowski, Alec Jacobson

Extended abstract published by Review of Undergraduate Computer Science

PATENTS

Swept Volume Determination Techniques

2021

Inventors: Silvia Sellán, Noam Aigerman, Alec Jacobson

Patent filed by Adobe Inc.

Generating Developable Depth Images Using Rank Minimization

Inventors: Silvia Sellán, Noam Aigerman, Alec Jacobson

United States Patent 11080819

SOFTWARE

gptoolbox - Geometry Processing Toolbox

Contributor and coauthor of the *gptoolbox* tutorial.

gpytoolbox - A Python Geometry Processing Toolbox

Sole Author.

libigl - A simple C++ geometry processing library

Contributor.

Open-source code is available on my website for all journal publications listed above.

AWARDS AND HONORS

Vanier Canada Doctoral Scholarship	<i>2021-2024</i>
Natural Sciences and Engineering Research Council of Canada (NSERC) <i>150,000 CAD award given only to 166 graduate students across all of Canada and all academic disciplines.</i>	
Adobe Research Fellowship	<i>2022</i>
Adobe Inc. <i>10,000 USD award given only to ..., graduate students worldwide.</i>	
Dean's Doctoral Excellence Scholarship	<i>2021</i>
University of Toronto Faculty of Arts & Science <i>25,000 CAD given to one single doctoral student across all the University of Toronto Faculty of Arts & Science disciplines.</i>	
Connaught International Scholarship for Doctoral Students	
University of Toronto School of Graduate Studies <i>10,000 CAD</i>	
Beatrice "Trixie" Worsley Graduate Scholarship in Computer Science	
University of Toronto Department of Computer Science <i>4,000 CAD given yearly to a student who has taken an active role in promoting women in Computer Science.</i>	
Connaught International Scholarship for Doctoral Students	<i>2020</i>
University of Toronto School of Graduate Studies <i>10,000 CAD</i>	
50th Anniversary Graduate Scholarship	
University of Toronto Department of Computer Science <i>2,000 CAD</i>	
Graduate Program Award	
University of Toronto Department of Computer Science <i>5,000 CAD</i>	
Program-level Fellowship	
University of Toronto Faculty of Arts and Sciences <i>1,000 CAD</i>	
Adobe Research Fellowship	
Adobe Inc. <i>Honorable Mention</i>	
Connaught International Scholarship for Doctoral Students	<i>2019</i>
University of Toronto School of Graduate Studies <i>10,000 CAD</i>	
Recognition of Excellence Award	
University of Toronto Department of Computer Science <i>5,000 CAD</i>	
Graduate Program Award	
University of Toronto Department of Computer Science <i>5,000 CAD</i>	
Program-level Fellowship	
University of Toronto Faculty of Arts and Sciences <i>1,000 CAD</i>	

Adobe Women in Technology Scholarship

Adobe Inc.

Honorable Mention

SenseTime Fellowship

MIT

Granted but declined

Scholarship for Academic Excellence

2014-2019

María Cristina Masaveu Peterson Foundation

50,000 EUR (10,000 EUR yearly)

COMMITTEE SERVICE

CVPR Deep Learning for Geometric Computing

2022

Organizing Committee Member

Remote

SIGGRAPH Research Career Development Committee

2021 - Present

Committee member (in undergraduate mentorship subcommittee)

Remote

ICCV Deep Learning for Geometric Computing

2021

Program Committee Member

Remote

REFEREE SERVICE

Eurographics Technical Papers

2021

ACM Transactions on Graphics (ToG)

ICCV DLGC Technical Papers

Journal of Computer Graphics Techniques (JCGT)

ACM SIGGRAPH Posters

DEPARTMENTAL SERVICE

Dean's Advisory Search Committee - Department Chair, Computer Science

2021-2022

Invited Member

Toronto, Canada

DGP Working Group on Fostering a Safe and Inclusive Workplace

2022

Member

Toronto, Canada

Graduate Applications Triager

2021

16 hours of paid work on processing graduate school applications

Toronto, Canada

TALKS GIVEN

Blender for Geometry Processing Academic Papers

July 2022

Graduate school course at SGP 2022

Location TBD

Uncertain Geometry Processing

December 2021

Technical presentation at TomatoGRAPH 2021

Toronto, Canada

Swept Volumes via Spacetime Numerical Continuation

August 2021

Technical Paper presentation at SIGGRAPH 2021

Virtual (originally Los Angeles, U.S.)

Mesh Math and Beyond: An introduction to shape representations

July 2021

Day-long tutorial at the MIT-ran Summer Geometry Institute (SGI)

Virtual

An Introduction to GP Programming in MATLAB with gptoolbox	<i>July 2021</i>
<i>Graduate school course at SGP 2021</i>	<i>Virtual (originally Toronto, Canada)</i>
A deep dive into implicit swept volumes	<i>June 2021</i>
<i>INRIA MFX research seminar, hosted by Prof. Sylvain Lefebvre</i>	<i>Virtual</i>
A deep dive into implicit swept volumes	<i>June 2021</i>
<i>MIT Vision and Graphics research seminar, hosted by Prof. Justin Solomon</i>	<i>Virtual</i>
Seamless Integration of Virtual and Real World	<i>May 2021</i>
<i>Doctoral Consortium presentation at Eurographics 2021</i>	<i>Virtual (originally Vienna, Austria)</i>
Differential Geometry: The Building Blocks of Computer Graphics	<i>March 2021</i>
<i>Research seminar at the Lancaster University Pure Mathematics Postgraduate Forum</i>	<i>Virtual</i>
Developable Surfaces: A Case Study in Discrete Differential Geometry	<i>December 2020</i>
<i>Research seminar at the Technion hosted by Prof. Mirela Ben-Chen</i>	<i>Virtual</i>
Efficient and Robust Swept Volumes	<i>December 2020</i>
<i>Technical presentation at GRAPHQUON 2020</i>	<i>Virtual</i>
Second best presentation award	
Opening and Closing Surfaces	<i>December 2020</i>
<i>Technical Paper presentation at SIGGRAPH Asia 2020</i>	<i>Virtual (originally Daegu, S. Korea)</i>
Morphological operations as geometric flows on surfaces	<i>November 2020</i>
<i>Research talk at Epic Games, Inc. hosted by Dr. Ryan Schmidt</i>	<i>Virtual</i>
Developable Surfaces: A Case Study in Discrete Differential Geometry	<i>November 2020</i>
<i>Research seminar at Carnegie Mellon University hosted by Prof. Keenan Crane</i>	<i>Virtual</i>
Developability of Heightfields via Rank Minimization	<i>October 2020</i>
<i>Opener talk for Prof. Olga Sorkine-Hornung at the Toronto Geometry Colloquium</i>	<i>Virtual</i>
Developability of Heightfields via Rank Minimization	<i>August 2020</i>
<i>Technical Paper presentation at SIGGRAPH 2020</i>	<i>Virtual (originally Washington, U.S.)</i>
Solid Geometry Processing on Deconstructed Domains	<i>October 2019</i>
<i>Research talk at Stanford University hosted by Prof. Doug James</i>	<i>Stanford, United States</i>
Solid Geometry Processing on Deconstructed Domains	<i>July 2019</i>
<i>Technical Paper presentation at Eurographics SGP 2019</i>	<i>Milan, Italy</i>
Applications of Geometry Processing to Computer Graphics	<i>June 2019</i>
<i>B.Sc. in Mathematics Thesis Defense</i>	<i>Oviedo, Spain</i>
An Introduction to Primal Inflation	<i>June 2019</i>
<i>B.Sc. in Physics Thesis Defense</i>	<i>Oviedo, Spain</i>
Morphological Operations as Geometric Flows on Surfaces	<i>August 2018</i>
<i>Fields Institute Undergraduate Summer Research Program</i>	<i>Toronto, Canada</i>
Morphological Operations as Geometric Flows on Surfaces	<i>July 2018</i>
<i>Department of Computer Science Undergraduate Summer Research Program</i>	<i>Toronto, Canada</i>
Solving PDEs on Overlapping Domains	<i>December 2017</i>
<i>Toronto-Montreal Area Graphics Workshop</i>	<i>Toronto, Canada</i>
Solving PDEs on Overlapping Domains	<i>August 2017</i>
<i>Fields Institute Undergraduate Summer Research Program</i>	<i>Toronto, Canada</i>

Solving PDEs on Overlapping Domains

Department of Computer Science Undergraduate Summer Research Program

July 2017

Toronto, Canada

IN THE NEWS

Computer graphics researcher Silvia Sellán is awarded two prestigious scholarships
A&S News, written by Chris Sasaki. Click to see archived version.

July 2021

ORGANIZING

CVPR Deep Learning for Geometric Computing

Organizing Committee Member

2022

Remote

SIGGRAPH Graduate Applications Mentorship Program

Founder and organizer.

2021

Remote

Summer Geometry Institute

Admissions committee member and session planner.

2021

Remote

Toronto-Montreal-Waterloo Graphics Workshop (TomatoGRAPH)

Student volunteer

2021

Toronto, Canada

Symposium on Geometry Processing (SGP)

Student volunteer working on tech support full time during the conference
and in Spanish-language outreach.

2021

Remote

Women in Graphics Research

Event Coordinator: Symposium on Geometry Processing.

2020 - Present

Remote

Toronto Geometry Colloquium

Founder, organizer and art director.

2020 - Present

Toronto, Canada

TEACHING

Summer Geometry Institute

Instructor of a full-day tutorial including lectures, coding demos and exercises.
Under the supervision of Professor Justin Solomon, MIT

Summer 2021

Symposium on Geometry Processing (SGP)

Co-lecturer of the SGP graduate school course *An introduction to geometry processing programming in MATLAB with gptoolbox*.

Summer 2021

CSC165: Mathematical Expression and Reasoning for Computer Science

Teaching Assistant (120 hours)
Professor David Liu

Winter 2020

Individual High School Tutoring

Weekly paid mathematics and physics tutoring

2015-2018

ANONYMOUS TEACHING FEEDBACK

Summer Geometry Institute

During the summer of 2021, I planned, prepared and conducted a 6-hour long tutorial session on the topic of shape representations for undergraduate students of underrepresented communities, as part of MIT's Summer Geometry Institute (SGI). A representative sample of the anonymous feedback collected by professor Justin Solomon about my teaching is reproduced below, each quotation corresponding to different student:

“Silvia Sellán’s presentation was idyllic, it gave the feeling of being a duck in a pond being fed delicious crumbs of bread, the students being the duck and Silvia the feeder throwing in one after another the information that we like the ducks devoured. The presentation itself was amazing to go beyond analogy it was clear and concise towards learning the topic, the information did not feel too overwhelming, nor too brief. The exercises as well as giving focus upon them and breaking them apart into which to do at what times, they felt like the perfect amount of material in order to have us learn and test our knowledge of the topics.”

“I just wanted to say that I really enjoyed Silvia’s programme. Cutting out all the formulas definitely made her material really accessible and easy to follow without worrying about the precise details of what is going on. I think leaving these details for us to figure out by doing the exercises is really good for developing understanding, rather than having a perhaps more technical talk which is harder to follow and then not quite knowing how to approach the exercises.”

“Silvia’s lecture was the easiest to follow and the most approachable.”

“Silvia’s tutorial: Lively and engaging, I liked how a narrative that tied in everything together neatly was presented.”

“I really liked Silvia Sellan’s tutorial day because for the presentations she gave us a story illustrating the motivation behind the concepts and theory and the actual coding assignments were very accessible and did not require a lot of background material.”

“I think a very good example of this was Silvia Sellan’s tutorial day. She approached the advanced topics from a big picture perspective and all of the coding exercises needed “basic” MATLAB and knowledge of calculus and a small amount of linear algebra.”

“I thoroughly enjoyed Silvia’s talk and the associated exercises.”

“I also found Silvia’s talk very valuable, not only for the geometry processing material offered (which was undoubtedly great, well-structured and very accessible), but also for increasing our awareness about potential nefarious uses of geometry processing. Also the brief digressions on true diversity when talking about fonts/letters were in my opinion very welcome – I (unfortunately) tend to think in a very “westernized” way, and it’s always good to bring awareness to things outside of our intellectual comfort zone.”

“I really liked Silvia Sellán’s day of the tutorial week. I think she did a really good job of creating presentations and exercises that met me where I am as a student without a formal experience in geometry processing. The mathematics and computer science that she talked as well as exercises she designed were accessible to me as someone who has undergraduate majors in mathematics and computer science as well as had participated in larger projects with programming computer graphics components. I also think she did a really good job of telling and motivating a story, which was really important to staying engaged throughout the day. I also really appreciate that she spoke about ethics in computing and the need to think critically about academic work. It’s definitely something that is not spoken enough about and that needs to be spoken about more.”

“YOU GUYS ARE WONDERFUL! Not gonna lie, I started looking at PhD opportunities to pursue this field after attending this program.”

MENTORING

Graduate School Applications

Volunteer mentoring of dozens of prospective Computer Graphics students from underrepresented groups with their graduate school application package and decisions. Successful applicant destinations include MIT, UCSD, University of Toronto, UBC and others.

2020 - Present

Virtual

University of Toronto DCS Graduate Applications Mentorship Program

Mentor for several prospective graduate students.

Fall 2021

Virtual

SIGGRAPH Graduate Applications Mentorship Program <i>Mentor for several prospective graduate students.</i>	<i>Fall 2021</i> <i>Virtual</i>
Fields Undergraduate Summer Research Program <i>Graduate research mentor for a group of undergraduate researchers.</i>	<i>Summer 2021</i> <i>Toronto, Canada</i>
Creating a better summer experience: A DEI workshop <i>Certified participation in DEI workshop for mentors of undergraduate students, organized by the Center for Minorities in the Mathematical Sciences.</i>	<i>Spring 2021</i> <i>Virtual</i>
Fields Undergraduate Summer Research Program <i>Graduate research mentor for a group of four undergraduate researchers.</i>	<i>2020 - 2021</i> <i>Toronto, Canada</i>

ANONYMOUS MENTORING FEEDBACK

Summer Geometry Institute

During the summer of 2021, I worked as a volunteer mentor for undergraduate students of underrepresented communities, as part of MIT's Summer Geometry Institute. A representative sample of the anonymous feedback about my mentoring collected by professor Justin Solomon is reproduced below, each quotation corresponding to different student:

"I still have no idea what Silvia's role was, but she went above and beyond to help out with everything. She made us all feel welcome in the Slack channel before SGI even started and continued to dole out advice and support throughout the whole of SGI. She also patiently answered my millions of questions almost as quickly as I could ask them."

"Silvia ensured we all felt welcome right from the beginning of the Slack channel. When we introduced ourselves, I noticed she found something nice to say to each of us, and it felt very welcoming to have that display of friendliness right from the get-go."

"Silvia Sellán, I would like to thank you specifically for the SGP & Siggraph 2021 wiggraph event, sharing your thoughts in grad school event and being accessible."

NON-ACADEMIC VOLUNTEERING

Reading Partners <i>Translation of documents into Spanish for literacy non-profit</i>	<i>August 2020</i> <i>United States</i>
General election worker <i>Day-long volunteer helping citizens vote on the day of the Spanish General Elections.</i>	<i>April 2019</i> <i>Spain</i>
General election worker <i>Day-long volunteer helping citizens vote on the day of the Spanish General Elections.</i>	<i>June 2016</i> <i>Spain</i>