

EDUCATION

University of Toronto

PhD in Computer Science
Supervisor: Alec Jacobson

2019 - 2024 (*expected*)

University of Oviedo

Bachelor's Degree in Physics

2015 - 2019

University of Oviedo

Bachelor's Degree in Mathematics

2014 - 2019

EXPERIENCE

Yale University

Consultant
Supervised by Prof. Theodore Kim

Winter 2022

Adobe Inc.

Research Intern
Mentored by Noam Aigerman and managed by Jovan Popovic

May 2020 - December 2020

Adobe Inc.

Research Intern
Mentored by Noam Aigerman and managed by Jovan Popovic

July 2019 - October 2019

Fields Institute for Research in the Mathematical Sciences

Undergraduate Research Intern
Supervised by Prof. Alec Jacobson

Summer 2018

Fields Institute for Research in the Mathematical Sciences

Undergraduate Research Intern
Supervised by Prof. Alec Jacobson

Summer 2017

ICMAT (Institute of Mathematical Sciences)

Grant Programme Severo Ochoa - Introduction to Research
Supervised by Prof. Javier Parcet

2017 - 2018

JOURNAL PUBLICATIONS

Fracture Modes for Realtime Destruction

Silvia Sellán, Jack Luong, Leticia Mattos Da Silva, Aravind Ramakrishnan, Yuchuan Yang, Alec Jacobson
Accepted to TBD Journal

2022

Swept Volumes via Spacetime Numerical Continuation

Silvia Sellán, Noam Aigerman, Alec Jacobson
ACM Transactions On Graphics (Proc. SIGGRAPH)

2021

Opening and Closing Surfaces

Silvia Sellán, Jacob Kesten, Ang Yan Sheng, Alec Jacobson
ACM Transactions On Graphics (Proc. SIGGRAPH Asia)

2020

- Developability of Heightfields via Rank Minimization** 2020
 Silvia Sellán, Noam Aigerman, Alec Jacobson
ACM Transactions On Graphics (Proc. SIGGRAPH)
- 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** 2021
 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** 2019
 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** 2018
 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** 2021
 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**
 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 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>	2021-2024
Adobe PhD Fellowship Adobe Inc. <i>10,000 USD award given only to ten graduate students worldwide.</i>	2022
Dean's Doctoral Excellence Scholarship 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>	2021
Connaught International Scholarship for Doctoral Students University of Toronto School of Graduate Studies <i>10,000 CAD</i>	2021
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>	2021
Adobe Research Fellowship Adobe Inc. <i>Honorable Mention</i>	2021
Connaught International Scholarship for Doctoral Students University of Toronto School of Graduate Studies <i>10,000 CAD</i>	2020
50th Anniversary Graduate Scholarship University of Toronto Department of Computer Science <i>2,000 CAD</i>	2020
Graduate Program Award University of Toronto Department of Computer Science <i>5,000 CAD</i>	2020
Program-level Fellowship University of Toronto Faculty of Arts and Sciences <i>1,000 CAD</i>	2020
Adobe Research Fellowship Adobe Inc. <i>Honorable Mention</i>	2020
Connaught International Scholarship for Doctoral Students University of Toronto School of Graduate Studies <i>10,000 CAD</i>	2019
Recognition of Excellence Award University of Toronto Department of Computer Science <i>5,000 CAD</i>	2019
Graduate Program Award University of Toronto Department of Computer Science <i>5,000 CAD</i>	2019

Program-level Fellowship University of Toronto Faculty of Arts and Sciences <i>1,000 CAD</i>	2019
Adobe Women in Technology Scholarship Adobe Inc. <i>Honorable Mention</i>	2019
SenseTime Fellowship MIT <i>Granted but declined</i>	2019
Scholarship for Academic Excellence María Cristina Masaveu Peterson Foundation <i>50,000 EUR</i>	2014-2019

ACADEMIC COMMITTEE SERVICE

ACM SIGGRAPH Women in Graphics Research Community Group Executive Committee Member	2022 - Present
SIGGRAPH Research Career Development Committee Committee member (in undergraduate mentorship subcommittee)	2021 - Present
Women in Computer Graphics Research (WiGRAPH) Executive Committee Member	2020 - 2022
CVPR Deep Learning for Geometric Computing Organizing Committee Member	2022
ICCV Deep Learning for Geometric Computing Program Committee Member	2021

REFeree SERVICE

CVPR DLGC Technical Papers	2022
ACM SIGGRAPH Technical Papers	2022
Eurographics Technical Papers	2021
ACM Transactions on Graphics (ToG)	2021
ICCV DLGC Technical Papers	2021
Journal of Computer Graphics Techniques (JCGT)	2021
ACM SIGGRAPH Posters	2021

DEPARTMENTAL SERVICE

Dean's Advisory Search Committee - Department Chair, Computer Science Invited Member	2021-2022
Graduate Applications Triager 16 hours of paid work on processing graduate school applications	2021

TALKS GIVEN

Mesh Math and Beyond: An introduction to shape representations Day-long tutorial at the MIT-ran Summer Geometry Institute (SGI)	July 2022 Virtual
Blender for Geometry Processing Academic Papers Graduate school course at SGP 2022	July 2022 Virtual
Sweeping Volumes University of Toronto Undergraduate Graphics Club	March 2022 Toronto, Canada
Uncertain Geometry Processing Technical presentation at TomatoGRAPH 2021	December 2021 Toronto, Canada
Swept Volumes via Spacetime Numerical Continuation Technical Paper presentation at SIGGRAPH 2021	August 2021 Virtual (originally Los Angeles, U.S.)
Mesh Math and Beyond: An introduction to shape representations Day-long tutorial at the MIT-ran Summer Geometry Institute (SGI)	July 2021 Virtual
An Introduction to GP Programming in MATLAB with GPTOOLBOX Graduate school course at SGP 2021	July 2021 Virtual (originally Toronto, Canada)
A deep dive into implicit swept volumes INRIA MFX research seminar, hosted by Prof. Sylvain Lefebvre	June 2021 Virtual
A deep dive into implicit swept volumes MIT Vision and Graphics research seminar, hosted by Prof. Justin Solomon	June 2021 Virtual
Seamless Integration of Virtual and Real World Doctoral Consortium presentation at Eurographics 2021	May 2021 Virtual (originally Vienna, Austria)
Differential Geometry: The Building Blocks of Computer Graphics Research seminar at the Lancaster University Pure Mathematics Postgraduate Forum	March 2021 Virtual
Developable Surfaces: A Case Study in Discrete Differential Geometry Research seminar at the Technion hosted by Prof. Mirela Ben-Chen	December 2020 Virtual
Efficient and Robust Swept Volumes Technical presentation at GRAPHQUON 2020 <i>Second best presentation award</i>	December 2020 Virtual
Opening and Closing Surfaces Technical Paper presentation at SIGGRAPH Asia 2020	December 2020 Virtual (originally Daegu, S. Korea)
Morphological operations as geometric flows on surfaces Research talk at Epic Games, Inc. hosted by Dr. Ryan Schmidt	November 2020 Virtual
Developable Surfaces: A Case Study in Discrete Differential Geometry Research seminar at Carnegie Mellon University hosted by Prof. Keenan Crane	November 2020 Virtual
Developability of Heightfields via Rank Minimization Opener talk for Prof. Olga Sorkine-Hornung at the Toronto Geometry Colloquium	October 2020 Virtual
Developability of Heightfields via Rank Minimization Technical Paper presentation at SIGGRAPH 2020	August 2020 Virtual (originally Washington, U.S.)
Solid Geometry Processing on Deconstructed Domains Research talk at Stanford University hosted by Prof. Doug James	October 2019 Stanford, United States
Solid Geometry Processing on Deconstructed Domains Technical Paper presentation at Eurographics SGP 2019	July 2019 Milan, Italy

Applications of Geometry Processing to Computer Graphics B.Sc. in Mathematics Thesis Defense	June 2019 Oviedo, Spain
An Introduction to Primal Inflation B.Sc. in Physics Thesis Defense	June 2019 Oviedo, Spain
Morphological Operations as Geometric Flows on Surfaces Fields Institute Undergraduate Summer Research Program	August 2018 Toronto, Canada
Morphological Operations as Geometric Flows on Surfaces Department of Computer Science Undergraduate Summer Research Program	July 2018 Toronto, Canada
Solving PDEs on Overlapping Domains Toronto-Montreal Area Graphics Workshop	December 2017 Toronto, Canada
Solving PDEs on Overlapping Domains Fields Institute Undergraduate Summer Research Program	August 2017 Toronto, Canada
Solving PDEs on Overlapping Domains Department of Computer Science Undergraduate Summer Research Program	July 2017 Toronto, Canada

IN THE NEWS

<i>Computer graphics researcher Silvia Sellán is awarded two prestigious scholarships</i> A&S News, written by Chris Sasaki (click to see archived version)	July 2021
<i>Silvia Sellán on Virtual Colloquium Planning</i> Q & A with WiGRAPH, written by Kate Salesin (click to see archived version)	June 2021

ORGANIZING

ACM SIGGRAPH Women in Graphics Research Community group Event Coordinator: Symposium on Geometry Processing.	2022 - Present
Toronto Geometry Colloquium Founder, organizer and art director.	2020 - Present
Summer Geometry Institute Admissions committee member and session planner.	2022
CVPR Deep Learning for Geometric Computing Organizing Committee Member	2022
Women in Graphics Research Event Coordinator: Symposium on Geometry Processing.	2020 - 2021
SIGGRAPH Graduate Applications Mentorship Program Founder and organizer.	2021
Summer Geometry Institute Admissions committee member and session planner.	2021
Symposium on Geometry Processing (SGP) Student volunteer working on tech support full time during the conference and in Spanish-language outreach.	2021
Toronto-Montreal-Waterloo Graphics Workshop (TomatoGRAPH) Student volunteer	2021

TEACHING

Summer Geometry Institute

Summer 2022

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

Symposium on Geometry Processing (SGP)

Summer 2022

Lecturer of the SGP course *Blender for Academic Papers*

Summer Geometry Institute

Summer 2021

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

Symposium on Geometry Processing (SGP)

Summer 2021

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

CSC165: Mathematical Expression and Reasoning for Computer Science

Winter 2020

Teaching Assistant (120 hours) for Prof. David Liu

Individual High School Tutoring

2015-2018

Weekly paid mathematics and physics tutoring

ANONYMOUS TEACHING FEEDBACK

Summer Geometry Institute

2021

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

2020 - Present

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.

Canadian Black Scientists Network Youth Science Fair

2022

Mentored grade 11 students with their project as part of University of Toronto's Pursue STEM

University of Toronto DCS Graduate Applications Mentorship Program

Fall 2021

Mentor for several prospective graduate students.

SIGGRAPH Graduate Applications Mentorship Program

Fall 2021

Mentor for several prospective graduate students.

Fields Undergraduate Summer Research Program

Summer 2021

Graduate research mentor for a group of undergraduate researchers.

Creating a better summer experience: A DEI workshop

Spring 2021

DEI workshop for mentors of undergraduate students, organized by the Center for Minorities in the Mathematical Sciences.

Fields Undergraduate Summer Research Program

2020 - 2021

Graduate research mentor for a group of four undergraduate researchers.

ANONYMOUS MENTORING FEEDBACK

Summer Geometry Institute

2021

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 wigggraph event, sharing your thoughts in grad school event and being accessible."

NON-ACADEMIC VOLUNTEERING

Reading Partners

August 2020

Translation of documents into Spanish for literacy non-profit

General election worker

April 2019

Day-long volunteer helping citizens vote on the day of the Spanish General Elections.

General election worker

June 2016

Day-long volunteer helping citizens vote on the day of the Spanish General Elections.