

Elizabeth R. Stephenson

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RESEARCH INTERESTS **Persistent Homology, Image Processing, Morse Theory**

EDUCATION **Institute of Science and Technology Austria**, Klosterneuburg, Austria

in progress: PhD., Computational Mathematics, *expected*: September 2018–2023

- Thesis: *A Generalization of the Medial Axis*
- Supervisor: Professor Herbert Edelsbrunner

University of Texas at Arlington, Texas, United States of America

Honors B.S., Pure Mathematics, August 2018, Magna cum laude.

- Honors Thesis: *Tangible Topology Through the Lens of Limits*
- Supervisor: Professor Barbara A. Shipman

INTERNSHIPS **Research Intern — Mathematical Biology** June 2016–December 2017

University of Texas at Arlington

Supervisor: Professor Hristo V. Kojouharov

- Developed and analyzed a novel mathematical model of skeletal muscle regeneration.
- Worked collaboratively with several research groups focusing on bone, muscle, and plant growth.
- Facilitated the formation of a heart muscle regeneration research group.
- Studied calcium dynamics in tumor cells.

Research Intern — Computational Algebraic Topology June–August 2017

Institute of Science and Technology Austria

Supervisor: Professor Herbert Edelsbrunner

- Studied the persistent homology of alpha and Vietoris-Rips complexes of metal organic frameworks after writing C++ code to convert the data files into a convenient format.

WORK EXPERIENCE **Mathematics Tutor**

University of Texas at Arlington

spring 2016–spring 2017

Tarrant County College, NW Campus

fall 2015–spring 2016

- Algebra, trigonometry, pre-calculus, calculus, differential equations, linear algebra

Peer Leader

Tarrant County College, NW Campus

fall 2015–spring 2016

- Led new student orientation; acted as a school ambassador

PUBLICATIONS **Mathematics**

1. Barbara A. Shipman and **Elizabeth R. Stephenson**. “Tangible Topology Through the Lens of Limits”, *PRIMUS*, January 2021. <https://doi.org/10.1080/10511970.2021.1872750>
2. **Elizabeth R. Stephenson** and Hristo V. Kojouharov. “A Mathematical Model of Skeletal Muscle Regeneration”, *Mathematical Methods in the Applied Sciences*, April 2018; 1-14. <https://doi.org/10.1002/mma.4908>

Art and Poetry

3. **Elizabeth Stephenson**, “Klosterneuburg Merry-Go-Round,” digitally manipulated photograph, *Panel Litmag Issue 6*, magazine, Budapest, December 2020. [Web Link](#).
4. **Elizabeth Stephenson**, “A Poem About Us”, poem, *Marine Creek Reflections*, Tarrant County College anthology, Texas, July 2016.
5. **Elizabeth Stephenson**, “Disintegration”, poem, *Marine Creek Reflections*, Tarrant County College anthology, Texas, July 2015.
6. **Lizzie Stephenson**, “Banana Caterpillar”, illustration, *They Draw and Cook for Kids*, ebook, September 2012. [Web Link](#).

SCHOLARSHIPS

- Marie Skłodowska-Curie Fellowship** summer 2019-summer 2020
Given to IST PhD students who meet a mobility criterion; funded by the European Union.
- Honors Dean Excellence Fund Scholarship** spring 2018
A scholarship given to exceptional UTA students in the Honors College at the discretion of the Dean and the Honors College Executive Committee.
- UT LSAMP SRA-A Fellowship** summer 2017
Research fellowship awarded to 8 undergraduates in Texas per year to fully fund 8 weeks of research in a country of their choice.
- H.A.D. Dunsworth Scholarship** fall 2016-spring 2018
Awarded to a UTA mathematics major who demonstrates strong overall academic performance and excellence in the study of mathematics.
- SURGE Scholarship** fall 2016-spring 2018
NSF-funded scholarship and mentoring program at UTA aimed at preparing undergraduates for graduate school.
- Great Lakes National Scholarship** fall 2015–spring 2016
Scholarship awarded to 750 STEM majors in the United States annually.

AWARDS

- Outstanding Junior Award** spring 2017
UTA award presented annually to third year undergraduate mathematics students with impressive academic performance.
- Outstanding Math Clinic Tutor Award** spring 2017
UTA award presented annually to an outstanding undergraduate mathematics tutor.
- Outstanding Achievement Award** spring 2015
Annual award by professor nomination to a Tarrant County College student who demonstrates academic ability, classroom participation, and community involvement.

TRAVEL GRANTS

- Midwest Geometry Conference** November 2017
Funded by the Kansas State University mathematics department and the UTA student chapter of the Mathematical Association of America to attend the 2017 Midwest Geometry Conference in Manhattan, Kansas.
- Field of Dreams Conference** November 2017
Funded by the National Alliance for Doctoral Studies in the Mathematical Sciences to attend the 2017 Field of Dreams conference in St. Louis, Missouri.
- LSAMP Student Research Conference** September 2016, 2017
Funded by LSAMP fellowship to travel to El Paso, Texas to present research conducted through the fellowship.
- Joint Mathematics Meetings** January 2017
Funded by the Mathematical Association of America to present mathematical biology research at JMM 2017 in Atlanta, Georgia.

	Texas Women in Mathematics Symposium	November 2016
	Funded by SURGE scholarship program to present mathematical biology research at TWIMS 2016 in Austin, Texas.	
	8th Annual NIMBioS Student Research Conference	October 2016
	Funded by both the UTA Honors College Excellence Fund and LSAMP fellowship to travel to Knoxville, Tennessee to present mathematical biology research.	
SELECTED PRESENTATIONS	“A Generalization of the Medial Axis”	February 2021
	First Austrian Day of Women in Mathematics, Vienna Austria	
	“Introduction to Discrete Morse Theory”	April 2019
	TopApp Workshop, Vienna Austria	
	“Shape Classification with Persistent Homology”	September 2017
	LSAMP Summer Research Academy Conference, El Paso Texas	
	“A Mathematical Model of Skeletal Muscle Regeneration”	January 2017
	Joint Mathematics Meetings, Atlanta Georgia	
	“A Mathematical Model of Skeletal Muscle Regeneration”	October 2016
	NIMBioS Undergraduate Research Conference, Knoxville Tennessee	
EXTERNAL WORKSHOPS ATTENDED	Summer School on Persistent Homology and Barcodes	summer 2019
	Lectures and one-week minicourses on persistent homology and symplectic geometry in Schloß Rauischholzhausen, Gießen, Germany.	
	Women in Computational Topology	summer 2019
	Thinking about solutions to relevant problems in computational topology in working groups for one week in Canberra, Australia.	
	TopApp Workshop	spring 2019
	Two-day topology workshop by young PhD students and for young PhD students in Vienna, Austria.	
	Workshop on Applied Topology	winter 2019
	One-week applied topology workshop in Kyoto, Japan.	
	Budapest Semesters in Mathematics	spring 2018
	Advanced undergraduate mathematics courses in Budapest, Hungary for four months.	
COMMUNITY INVOLVEMENT	PhD Applicant Pre-Screening	spring 2021
	Volunteered to help pre-screen new mathematics PhD students applications to IST Austria. Pre-screeners were asked to reject a threshold of about 50 percent of applications before forwarding the better ones to faculty.	
	Masters Program Working Group	fall 2020
	Computer Science track student representative in a committee establishing guidelines and expectations for the creation of a Masters degree program at IST.	
	Think and Drink Committee	fall 2018-spring 2019
	Member of committee of PhD students at IST that invite IST faculty, post-docs, and PhD students to give weekly research talks in an informal setting.	
	Association for Women in Mathematics	fall 2015–fall 2017
	Member and spring 2016-17 President of UTA’s chapter of AWM, a mathematics organization dedicated to promoting women and girls as they pursue the mathematical sciences. During my tenure as president, we were nominated and selected as the	

inaugural national award winner of the AWM Student Chapter Award for Fundraising and Sustainability.

Ye Royal Society of Poultry Homotopy spring 2017–fall 2017

Founding member of this unique secret mathematics and bread-baking society at UTA.YRSPH’s goals are to inflict a passion for mathematics upon unsuspecting mathematicians and to turn chickens into ostriches via algebraic topology.

MISCELLANEOUS **IST Mathematics promo video** December 2020

Featured in promo video for IST Austrias mathematics department as a recruiting tool for new students. Spoke about life at IST, and provided graphics from my research for the video scene segues.

AWM National Award Article August 2017

Interviewed for article recognizing UTA’s student chapter of the Association for Women in Mathematics as the inaugural national award winner for sustainability.

F-GAP Nomination May 2017

Nominated by the UTA Mathematics Dept. for inclusion in the Facilitated Graduate Applications Process through the National Alliance for Doctoral Studies in the Mathematical Sciences.

Veneratio Article November 2016

Research featured in the UTA Honors College biannual newsletter, *Veneratio*.

TECHNICAL
EXPERIENCE MATLAB • Python • C++ • L^AT_EX • Adobe Photoshop