

# IZABEL PIRIMAI AGUIAR

## EDUCATION

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**UNIVERSITY OF COLORADO**, Boulder, CO **GPA: 3.9**  
*MS Computer Science*, August 2017 - May 2018  
Thesis: *A data-driven approach to computing time-dependent active subspaces in dynamical systems*  
Committee: Paul Constantine (advisor), Gianluca Iaccarino, Elizabeth Bradley, Jim Curry

**COLORADO SCHOOL OF MINES**, Golden, CO **Magna Cum Laude**  
*BS Applied Mathematics and Statistics*, August 2013 - August 2017 **GPA: 3.76**

**UNIVERSITY OF CANTERBURY**, Christchurch, NZ  
*Study Abroad*, December 2015 - July 2016

**Research Interests** *Dimension reduction, dynamical systems, uncertainty quantification, mathematical biology, humanistic mathematics, science communication, information based complexity*

## AWARDS

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**Knight-Hennessy Scholar** *Awarded full funding to pursue a PhD at Stanford while developing interdisciplinary connections and global leadership. Selected for exhibiting and valuing independence of thought, purposeful leadership, and civic mindset.*

**NSF Graduate Research Fellow** *Awarded full funding and support for demonstrated potential to contribute to strengthening the vitality of the U.S. science and engineering enterprise.*

**Beverly Sears Graduate Student Grant** *Awarded to pursue research and attend and present at national and international conferences.*

**Mike and Patty Starzer Scholar** *Awarded full tuition and fees for academic excellence and campus involvement.*

**MLK Jr. Recognition Award** *Recognized for exceptional appreciation for diversity and understanding of its value on the Mines campus through work with the campus club, Equality Through Awareness.*

**E-Days Engineer Award** *Selected by the Department of Applied Mathematics and Statistics as an outstanding graduating senior.*

**AMS Honor Fund Learning and Perseverance Award** *Recognized as an exceptional student who has shown perseverance, hard work, and dedication.*

**SIAM Student Travel Award** *Funding to attend, present, and report from the Annual Meeting.*

**Student Presentation Grant** *Invitation and grant to present at the 2018 Department of Energy Conference on Data Analysis.*

**Student Travel Award** *Grant to attend and present at the 2018 Dynamics Days US Conference.*

## RESEARCH EXPERIENCE

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**Dynamic Active Subspaces** May 2017 - Present  
*Advisor: Dr. Paul Constantine*

- Active subspaces in parameterized dynamical systems* manuscript in preparation.
- Ignite talk and poster presentation at US Dynamics Days Conference, Jan 2018
- Presentation at Joint Mathematics Meetings session on Dynamic and Ergodic Theory, Jan 2018
- Seminar for CU Boulder Dynamical Systems group, Feb 2018
- Presentation at Auckland Numerical ODEs Conference, Feb 2018
- Minisymposium presentation at SIAM Conference on Uncertainty Quantification, April 2018
- Poster presentation at Dynamics Days US, January 2018
- Poster presentation at the DOE Conference on Data Analysis, March 2018
- Poster presentation at the CU Computer Science Graduate Student Expo, March 2018
- Poster presentation at SIAM Conference on Uncertainty Quantification, April 2018
- Poster presentation at the SIAM Workshop on Parameter Space Dimension Reduction, July 2017

-Poster presentation at the SIAM Annual Meeting, July 2017

*Defining, analyzing, and computing time-dependent active subspaces in dynamical systems. Implementing dynamic mode decomposition (DMD), sparse identification for nonlinear dynamical systems (SINDy), and other methods to discover and reconstruct dynamical systems that model global parameter sensitivity.*

### **The Rape Victims of Genghis Khan**

October - December 2015

Advisor: Dr. Cecilia Diniz Behn

-Aguiar, I., Deters, J., Feuerborn, J. (2017). *The Rape Victims of Genghis Khan*. manuscript submitted to SIAM Undergraduate Research Online July 2017.

*Developed and implemented a historically informed population model to estimate a range for the number of women Genghis Khan raped in his lifetime, providing quantifiable insight into the historical narrative.*

### **The Mathematics of Gossip**

January 2017

*Independent Research*

- Keynote presentation at Boulder Nerd Night science outreach program, Jan 2018
- Presentation at Joint Mathematics Meetings MAA session on Humanistic Mathematics, Jan 2018
- Presentation at SIAM Front Range Student Conference, March 2017
- Poster Presentation at Nebraska Conference for Undergraduate Women in Mathematics, Feb 2017

*Developed a numerical model to investigate the spread of gossip throughout a community using an epidemiological model. Analysis provides a quantitative approach to studying sociological systems.*

## **SCIENCE COMMUNICATION**

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### **PUBLICATIONS**

Aguiar, I. (2017, September). "Diversity: A Recurring Theme at the SIAM Annual Meeting". *Newsjournal of the Society for Industrial and Applied Mathematics*. Print. Vol 50, Issue 7.

Aguiar, I. (2017, September). "Funny Faces at the Fellows Reception". *Newsjournal of the Society for Industrial and Applied Mathematics*. Print. Vol 50, Issue 7.

Aguiar, I. (2017, July 20). "Communication Doctors at the SIAM Annual Meeting". *SIAM News Blog*.

Aguiar, I. and Deters, J. (2017, January 23). "Talk Math to Me". *SIAM News Blog*.

Aguiar, I. (2017, January 13). "The Shoes of JMM". *SIAM News Blog*.

Aguiar, I. (2017, January 9). "Math Girls: Exploring Math Through Comics". *SIAM News Blog*.

### **EXPERIENCE**

**Founder and Writer**, *The Neural Network* September 2017 - Present

-Interview professors, staff, and students in the CU Department of Computer Science. Write and distribute weekly articles to foster community, collaboration, and humanization.

**Interviewer and Writer**, *Getting to know the Women in Data Science* December 2017 - Present

-Interview speakers of the Women in Data Science global conference. Write and distribute profiles of influential data scientists highlighting advice for aspiring women data scientists with the aim to encourage diversity and community in the field.

**Colloquium Correspondent** August 2016 - May 2017

*Department of Applied Mathematics and Statistics*

-Research and present mathematics and statistics news. Interview professors, staff, and the Colorado School of Mines President. Sponsored to attend and report from the 2017 Joint Mathematics Meeting.

**SIAM News Freelance Writer**, *SIAM News* January 2017-Present

**SIAM Communication Doctor**, *SIAM Annual Meetings* July 2017

**SIAM News Freelance Editor**, *SIAM Unwrapped* April 2017

## INTERNSHIPS & TEACHING EXPERIENCE

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<b>Systems Analyst</b> <i>Cigna Health Group</i>	May - August 2015
<b>Teaching Assistant</b> <i>Green Mountain High School</i>	August - December 2017
<b>Data Analyst and Teaching Assistant</b> <i>Honors Calculus III</i>	February 2015 - May 2017
<b>Peer Educator</b> <i>Center for Academic Services and Advising</i>	August - December 2016
<b>Grader</b> <i>Mathematical Biology, Calculus II, Calculus III</i>	August 2015 - May 2017

## SERVICE

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<b>Society for Women in Mathematics</b> <i>Executive Officer</i>	August 2014 - May 2017
<b>Equality Through Awareness</b> <i>Executive Officer</i>	August 2016 - May 2017
<b>Teacher Education Alliance</b> <i>Co-Founder, Vice President</i>	August 2016 - May 2017
<b>Reading Partners</b> <i>Tutor</i>	October 2014 - May 2015

## SKILLS AND COURSEWORK

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**Computer:** Python, C++, MATLAB, L<sup>A</sup>T<sub>E</sub>X, R, Excel, Word, Keynote, wordpress

**Coursework:** *Graduate Level:* Computational Linear Algebra, Numerical Methods for PDEs, Design and Analysis of Algorithms, Natural Language Processing, Biologically-Inspired Multi-Agent Systems, Chaotic Dynamics, Sensitivity Analysis, User Centered Design and Development, Linear Vector Spaces, Educational Technology. *Undergraduate Level:* Numerical Methods for ODEs, Data Structures, Mathematical Biology, PDEs, Complex Analysis, Real Analysis, Spatial Statistics, Abstract Algebra, Programming Concepts, Generalized Linear Models, Time Series Analysis.