

## Kelsey L. Maass

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**CONTACT INFORMATION**     *Department of Applied Mathematics*     (425) 205-0965  
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*Seattle, Washington 98195*     [github.com/kels271828](https://github.com/kels271828)

**EDUCATION**     *Doctor of Philosophy, Applied Mathematics, GPA: 3.87*  
*University of Washington, Seattle, WA, expected June 2020*  
*Advanced Data Science Option*

*Master of Science, Applied Mathematics, GPA: 3.87*  
*University of Washington, Seattle, WA, June 2015*

*Bachelor of Arts, Mathematics, GPA: 4.0*  
*Azusa Pacific University, Azusa, CA, May 2009*  
*Minors: Philosophy and Spanish*

**RESEARCH INTERESTS**     My research is focused on developing new applications of optimization and machine learning in the field of radiation oncology. In particular, I am interested in methods for handling nonconvex dose-volume constraints in intensity-modulated radiation therapy, hyperparameter selection in treatment planning inverse problems, and feature selection for models to predict patient outcomes and side effects.

**HONORS**

- UW Data Science Summit (Best Poster)     April 2018
- UW eScience Institute IGERT Data Science Fellowship     2017-2019
- Boeing Fellowship in Applied Mathematics     Spring 2018
- UW Data Science Poster Session (Honorable Mention)     February 2017
- SIAM UW's Annual Poster Competition (Second Place)     February 2017
- SIAM UW's Annual Poster Competition (First Place)     February 2016
- UW Graduate School Top Scholar Award     Winter - Spring 2016
- Dorothy Lewis Simpson ARCS Endowment Recipient     2015 - 2017
- Fulbright English Teaching Assistantship Grant, Andorra     2009 - 2010
- Outstanding Senior Award in Mathematics, Azusa Pacific University     May 2009
- Science and Math Scholarship Program, Azusa Pacific University     2005 - 2007

**SOFTWARE DEVELOPMENT**

- Experience with Julia, Matlab, and Python
- Coursework in C, C++, Java, R, and SQL
- Basic Bash, CSS, Git, HTML, and Javascript

**RELEVANT COURSEWORK**

- AMATH 583 High Performance Scientific Computing (Python, C)
- AMATH 582 Computational Methods for Data Analysis (Matlab)
- AMATH 516 Numerical Optimization (Matlab)
- AMATH 515 Fundamentals of Optimization (Matlab)
- AMATH 514 Networks and Combinatorial Optimization
- AMATH 481 Scientific Computing (Matlab)
- CSE 546 Machine Learning (Matlab, Python)
- CSE 512 Data Visualization (Tableau, D3)
- CSE 414 Introduction to Database Systems (SQL)
- CSE 373 Data Structures and Algorithms (Java)
- EE 578 Convex Optimization (Matlab)
- IND E 599 Data-Driven Optimization - Audit
- NEURO 511 Intelligent Machinery, Identity, and Ethics
- STAT 509 Econometrics (R)

**TEACHING  
EXPERIENCE**

*Lead Instructor*

Department of Applied Mathematics, University of Washington, Seattle, WA

- Linear Algebra and Numerical Analysis Winter 2019

*Teaching Assistant*

Department of Applied Mathematics, University of Washington, Seattle, WA

Department of Mathematics, University of Washington, Seattle, WA

- Linear Algebra and Numerical Analysis Fall 2013 - Spring 2015, Summer 2017
- Partial Differential Equations and Waves Summer 2017
- Beginning Scientific Computing Spring 2017
- Precalculus Winter 2016
- Calculus with Analytic Geometry Fall 2015
- Mathematical Methods for Computational Finance (Coursera.org) Fall 2013

*Lead Instructor*

June - August 2015

Girls Who Code Summer Immersion Program, AT&T, Bothell, WA

- Lead 7-week project-based computer science course for 20 high school girls
- Taught a variety of topics including programming fundamentals, robotics, web design, and algorithms using Scratch, Python, JavaScript, HTML, and CSS

**RESEARCH  
EXPERIENCE**

*PhD Intern*

Summer 2019

Pacific Northwest National Laboratory, PCSD Data Analytics Group, Richmond, WA

- Used graphical models and optimization methods to estimate travel time between traffic analysis zones and along road segments using Uber Movement data

*Graduate Research Assistant*

Fall 2016

Department of Radiation Oncology, University of Washington, Seattle, WA

- Worked with Dr. Minsun Kim to model optimal multi-modality cancer treatment policies using a Markov decision process approach
- Implemented our model in matlab, including an interactive GUI

**PAPERS**

Maass, K., Kim, M. (2019) A Markov decision process approach to optimizing cancer therapy using multiple modalities. *Math. Med. Biol.*, 00, 1-18.

Maass, K., Kim, M., Aravkin, A. (2019) A nonconvex optimization approach to IMRT planning with dose-volume constraints. *Submitted to INFORMS J. Comput.*

**TALKS &  
POSTERS**

*A Nonconvex Optimization Approach to IMRT Planning with Dose-volume Constraints*

- Fundamentals of Data Analysis Summer School, Madison, WI July 2018
- SIAM Annual Meeting, Portland, OR July 2018
- UW Data Science Summit (Best Poster) April 2018
- UW AMATH Seminar Lightning Talk December 2017

*A Markov Decision Approach to Optimizing Cancer Therapy Using Multiple Modalities*

- ARCS Science and Law: A Forward Thinking Collaboration February 2018
- SIAM Conference on Optimization, Vancouver, BC May 2017
- SIAM UW Annual Poster Competition (Second Place) February 2017

*Image Deblurring with Blur Learning*

- UW Data Science Poster Session (Honorable Mention) February 2017
- SIAM Annual Meeting, Boston, MA July 2016
- SIAM UW Annual Poster Competition (First Place) February 2016

*The Harmonic Method for Tidal Prediction*

- South Seattle College, RST Academy Speaker Series March 2017
- UW Applied Mathematics Master's Symposium May 2015

**SYNERGISTIC  
ACTIVITIES**

*Graduate Student Representative* 2018-2019

Department of Applied Mathematics, University of Washington, Seattle, WA

- Attend faculty meetings and communicate student concerns to faculty members
- Coordinate student mentor program and student office assignments
- Help organize departmental events

*Women in Applied Mathematics Mentorship Program* Spring 2018 & 2019

- Assisted with grant application, student selection process, and program development as a member of the Applied Mathematics Diversity Committee
- Mentored an undergraduate student on an independent research project in linear algebra and facial recognition

*Diversity Committee Member* 2017 - 2018

Department of Applied Mathematics, University of Washington, Seattle, WA

- Hosted various programs and events with the goal of recruiting, supporting, and promoting a diverse student population within the department

*SIAM UW Webmaster* 2017 - 2018

Department of Applied Mathematics, University of Washington, Seattle, WA

- Redesigned the SIAM UW webpage (<http://students.washington.edu/siamuw/>)
- Maintained the SIAM UW calendar and internal wiki
- Co-organized weekly meetings featuring tutorials, panels, and speakers

*SIAM UW Outreach Coordinator* 2016 - 2017

Department of Applied Mathematics, University of Washington, Seattle, WA

- Organized math workshop for UW Women's Center Summer Bridge Program
- Organized annual math fair at Lockwood Elementary School
- Co-organized weekly meetings featuring tutorials, panels, and speakers

*Math Fair Volunteer*

- Girl Scouts of Western Washington, Seattle, WA April 2018
- Julia Robinson Math Festival, Seattle, WA April 2016
- Shelton View Elementary School, Bothell, WA March 2014
- Lockwood Elementary School, Bothell, WA December 2013/14/15/16/17/18

*Volunteer Instructor* 2014 - 2018

Girls Who Code Clubs, University of Washington Women's Center, Seattle, WA

- Lead weekly club meetings for group of middle school and high school girls
- Taught computer science concepts and programming skills through fun projects

**MEMBERSHIPS**

- Association for Women in Mathematics, University of Washington
- American Mathematical Society, University of Washington
- Society for Industrial and Applied Mathematics, University of Washington
- Alpha Chi National College Honor Society, Azusa Pacific University
- Sigma Delta Pi Sociedad Nacional Honoraria Hispánica, Azusa Pacific University