

## Kelsey L. Maass

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**CONTACT INFORMATION**     *Department of Applied Mathematics*     (425) 205-0965  
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*Lewis Hall, #222*     [github.com/kels271828](https://github.com/kels271828)  
*Seattle, Washington 98195*

**EDUCATION**     *Doctor of Philosophy, Applied Mathematics, GPA: 3.88*  
*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  
(Integrative Graduate Education and Research Traineeship)
- 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  
(Achievement Rewards for College Scientists, Seattle Chapter)
- 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

**RESEARCH EXPERIENCE**     *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

**TEACHING EXPERIENCE**     *Teaching Assistant*  
*University of Washington, Seattle, WA*

- Partial Differential Equations and Waves     Summer 2017
- Beginning Scientific Computing     Spring 2017
- Precalculus     Winter 2016
- Calculus with Analytic Geometry     Fall 2015
- Linear Algebra and Numerical Analysis     Fall 2013 - Spring 2015, Summer 2017
- 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

**SOFTWARE DEVELOPMENT** - Experience with Julia, Matlab, and Python  
- Coursework in C, C++, Java, and R  
- 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 373 Data Structures and Algorithms (Java)  
- EE 578 Convex Optimization (Matlab)  
- STAT 509 Econometrics (R)

**PAPERS** K. Maass, M. Kim, *A Markov decision process approach to optimizing cancer therapy using multiple modalities* (2017) arXiv:1706.09481 [math.OC, physics.med-ph]. (Under review at Mathematical Medicine & Biology)

K. Maass, A. Aravkin, M. Kim, *Modeling Nonconvex Dose-Volume Constraints for Radiation Therapy*. (In preparation)

**TALKS & POSTERS**

*Modeling Nonconvex Dose-Volume Constraints for Radiation Therapy*

- SIAM Annual Meeting, Portland, OR July 2018
- UW Data Science Summit (Best Poster) April 2018
- UW AMATH Seminar Lightning Talk December 2017
- Advisor: Dr. Aleksandr Aravkin, UW Department of Applied Mathematics
- Advisor: Dr. Minsun Kim UW Department of Radiation Oncology

*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
- Advisor: Dr. Minsun Kim, UW Department of Radiation Oncology

*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
- Advisor: Dr. Aleksandr Aravkin, UW Department of Applied Mathematics

*The Harmonic Method for Tidal Prediction*

- South Seattle College, RST Academy Speaker Series March 2017
- UW Applied Mathematics Master's Symposium May 2015
- Advisor: Dr. Loyce Adams, UW Department of Applied Mathematics

**SYNERGISTIC  
ACTIVITIES**

*Women in Applied Mathematics Mentorship Program* Spring 2017  
• 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* Spring 2017 - Present  
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  
• Maintained the SIAM UW webpage, 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

*Volunteer Instructor* Fall 2014 - Present  
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