# Henry Kvinge

Address: Mathematics Department
University of California, Davis
One Shields Ave.
Davis, CA 95616-5270

Email Address: hkvinge@math.ucdavis.edu
Homepage: https://hkvinge.github.io
Cell phone (360)-481-5411

## EDUCATION

University of California, Davis (expected June 2017) GPA: 4.00
**PhD, Mathematics**

University of Washington, Seattle (March 2010) GPA: 3.90
**BS, Mathematics, BA, Biochemistry**
*Magna Cum Laude*

## TECHNICAL SKILLS

**Languages:** Python (`NumPy, SciPy, Pandas, Scikit-learn`), R, C++, Matlab, LaTeX.

## TECHNICAL EXPERIENCES

**Doctoral researcher**, UC Davis (2011-2017)

*Subject*: Representation theory, the study of mathematical symmetry.

- Identified and exploited patterns in combinatorial data to improve understanding of symmetries arising in quantum field theory.
- Independently completed two long-term research projects resulting in papers:
  - proved that a graphical calculus related to the Heisenberg algebra can be modeled by a family of polynomials from probability theory,
  - demonstrated how symmetries in quiver Hecke algebras can be understood via a special family of colored directed graphs.
- Carried out a successful international collaboration with researchers in Australia.

**Math-to-Industry Bootcamp participant**, Institute for Mathematics and its Applications, Minneapolis (June-July, 2016)

- Intensive 6-week program to give math PhD students the skills to succeed in industry.
- Took courses in C++, Python, statistics, and machine learning.

## DATA SCIENCE PROJECTS

- **Predicting physician triage decisions using machine learning,** (capstone project for Math-to-Industry Bootcamp, 2016)
  - Built a model in Python for Revon Systems, Inc. which predicts the physician triage decision for patients suffering from chronic asthma based on their current conditions.
  - Received mentoring from chief data scientist at Revon, Dr. Sumanth Swaminathan.
- **Volunteer data scientist for "Investigation of the effects of solar radiation and pollution on crop yield"** (UC Davis Data Science Initiative, 2017)
  - Collected and wrangled data on solar radiation, crop yield, and pollution from online databases.
  - Performed exploratory data analysis in R and Python and presented results to team.

## PUBLICATIONS AND PREPRINTS

- *Khovanov's Heisenberg category, moments in free probability, and shifted symmetric functions* (with Anthony Licata, Stuart Mitchell), arXiv:1610.04571 (2016).
- *Categorifying the tensor product of the Kirillov-Reshetikhin crystal $B^{1,1}$ and a fundamental crystal* (with Monica Vazirani), arXiv:1508.04182 (2015).

  Extended abstract in Proceedings of the 28th International Conference on Formal Power Series and Algebraic Combinatorics, Discrete Math. Theor. Comput. Sci. Proc. (2016), pp. 719-730.

## OTHER EXPERIENCES

**Commercial fisherman**, Bristol Bay, AK (1999-2015): Worked as a deckhand on the commercial salmon fishing vessel *Anny Joy* for 6 weeks each summer.
**Associate instructor**, UC Davis (2015-2016): Prepared and delivered lectures, wrote exams, and assigned grades for *Calculus for Biology and Medicine* and *Combinatorics*.
**Assistant language teacher**, Izuhara High School (2010-2011): Created and implemented lesson plans for English language courses on Tsushima Island, Japan.

### Volunteer

**Data scraper** (Feb. 2, 2017): UC Davis ClimateRefuge/DataRescue event.
**Graduate mentor** (2013-2016): Women in Science and Engineering Mentoring Program.
**Volunteer math tutor** (2011-2016): STEM Café, a tutoring center that serves women and other underrepresented groups in math.