

# Cheyne Homberger

cheyne.homberger@gmail.com • <http://cheynehomberger.com>

---

## Education

- Ph.D. in Mathematics – University of Florida** May 2014  
Dissertation: *Patterns in Permutations and Involutions, a Structural and Enumerative Approach*  
Advised by Miklós Bóna. Available at arXiv:1410.2657 [math.CO].
- M.S. in Mathematics – University of Florida** May 2011
- B.S. in Mathematics, Minor in Education – University of Florida** May 2009

## Publications and Preprints

- Equipopularity in the Separable Permutations,*** Oct 2014  
Michael Albert, Cheyne Homberger, Jay Pantone  
• Submitted, arXiv:1410.7312 [math.CO].
- Deflatability of Permutation Classes,*** Sep 2014  
Michael Albert, Mike Atkinson, Cheyne Homberger, Jay Pantone  
• Submitted, arXiv:1409.5296 [math.CO].
- Pattern-Avoiding Involutions: Exact and Asymptotic Enumeration,*** Oct 2013  
Miklós Bóna, Cheyne Homberger, Jay Pantone, Vince Vatter  
• Submitted, arXiv:1310.7003 [math.CO].
- On the Effective and Automatic Enumeration of Polynomial Permutation Classes,*** Sep 2013  
Cheyne Homberger and Vince Vatter  
• Submitted, arXiv:1308.4946 [math.CO].
- Counting Fixed Length Permutation Patterns,*** Nov 2012  
Cheyne Homberger  
• Online Journal of Analytic Combinatorics, 7 (2012).
- Expected Patterns in Permutation Classes,*** Oct 2012  
Cheyne Homberger  
• Electronic Journal of Combinatorics, 19 (3) (2012) Paper 43.

## Selected Teaching Experience

**Overall student evaluation: 4.70/5, with 502 total students. (Department average: 4.08/5)**

### Instructor:

- College Algebra, Precalculus Algebra** Aug 2010 – Dec 2011  
• Developed and implemented specialized intensive curricula for students with weak math backgrounds.
- Math for Liberal Arts Majors** Jun 2011 – Aug 2011  
• Independently developed and implemented a curriculum designed to give liberal arts students an appreciation for mathematics.

### Assistant:

- Calculus 1, 2, and 3** Jan 2012 – Dec 2013  
• Led weekly discussions and wrote exams and quizzes for full undergraduate calculus sequence (through multivariable vector calculus).
- Math for Liberal Arts Majors, Precalculus and Trigonometry** Aug 2009 – Aug 2010  
• Led weekly discussions and wrote exams and quizzes for large lecture courses.

## Selected Talks and Presentations

- Pattern Popularity and Separable Permutations*** Sep 2014  
• Invited talk, Howard University, Washington, DC.
- Real Applications of Structural Combinatorics*** Mar 2014  
• Invited talk, CICADA/DIMACS, Rutgers University, Piscataway, NJ.
- Expected Patterns in Permutation Classes*** Sep 2012  
• Invited talk, AMS Eastern Sectional Meeting, Rochester Institute of Technology, Rochester, NY.
- Expected Patterns in Permutations Avoiding 123*** Jun 2012  
• Contributed talk, Permutation Patterns 2012, University of Strathclyde, Glasgow, Scotland.

**Automatic Enumeration of Polynomial Permutation Classes  
and Applications to Genomics** May 2012

- Poster, CANT 2012 Summer School and Conference. Centre International de Rencontres Mathématiques (CIRM), Marseilles, France.

**Enumerating Large Patterns in Permutations** Jan 2011

- Invited talk, University of Florida Interdisciplinary Research Conference. Gainesville, FL.

**The Expected Number of Distinct Maximal Minors of a Permutation** Oct 2010

- Invited talk, AMS Eastern Sectional Meeting. Syracuse University, Syracuse, NY.

**The Number of Distinct Minors of a Permutation** Aug 2010

- Contributed talk, Permutation Patterns 2010. Dartmouth College, Hanover, New Hampshire.

## Awards and Support

**UF College of Liberal Arts and Sciences Dissertation Fellowship - \$5500** Jan 2014

**UF Center for Applied Math Summer Research Fellowship - \$3000** Apr 2013

**UF Certificate of Excellence in Teaching** Apr 2012, Apr 2013

**Chat Yin Ho Scholarship - \$2000** Apr 2012

**UF Computational Biology Initiative Seed Grant - \$8000** Jan 2011 – May 2011

**UF Grinter Fellowship - \$2000** Aug 2009

## Service

### Peer Reviewer

- *Electronic Journal of Combinatorics*, and *Pure Mathematics and Applications*.

**UF LaTeX Workshop – Organizer and Presenter** Apr 2012, Apr 2013

- Annual workshop with total attendance of over two-hundred students and faculty.

**UF Grad Student Mentoring Award – Organizer and Reviewer** Oct 2013

- Established and judged a university-wide award showcasing student accomplishments in mentoring.

**UF I-Cubed Program – Graduate Student Advisory Council Co-Chair** Sep 2011 – Jan 2013

- Helped to manage a large NSF grant aimed at increasing collaboration and communication amongst UF graduate departments.
- Organized three annual conferences showcasing graduate research. Attendance of over one-hundred and fifty, two-hundred and fifty, and three hundred, respectively.

**Mathematics Department Faculty Graduate Committee - Member** Aug 2011 – Jan 2013

- Co-authored a five year department restructuring plan for university administration.
- Co-authored a department guide for incoming graduate students.

### Graduate Mathematics Association

**President** Jan 2012 – Jan 2013

**Vice President** Jan 2011 – Jan 2012

- Established and organized a biweekly interdisciplinary seminar and a mentoring program for incoming graduate students.
- Organized social events and provided resources and support for graduate students.

**Graduate Student Council – Department Representative** Jan 2011 – Aug 2012

- Coordinated with graduate student leaders of various graduate programs to bring ideas and concerns to university administration.

## Additional Skills and Experience

### Software

- Extensive experience with Python, R, C, Sage, Java, Maple, GAP, and Matlab for generating, interpreting, and visualizing data.
- Authored a python package for working with permutations, available at <https://github.com/cheyneh/permpy>.
- Used Java and Processing languages to develop interactive lessons targeted at non-science oriented undergraduate students.
- Utilized Sakai, Blackboard, WebAssign, MyMathLab educational platforms.

### Languages

- French: Intermediate comprehension, basic conversation.
- Spanish: Basic comprehension/conversation.