

Michael Bannister

Employment

Assistant Professor	Santa Clara University	9/2016–8/2017
Taught courses in programming and the theory of algorithms. Published research in graph drawing and network visualization. Received consistently high teaching evaluations.		
Visiting Assistant Professor	Pomona College	7/2015–6/2016
Taught courses in data structures, computational photography and discrete mathematics. Received consistently high teaching evaluations. Supervised senior projects in cryptography, game tree search and visualization.		
Graduate Student	University of California, Irvine	9/2010–6/2015
Served as a graduate student researcher and as a teaching assistant. Won the best presentation award at the 21st International Symposium on Graph Drawing out of the 40+ presentations given.		
Graduate Student Instructor	University of California, Irvine	6/2014–9/2014
Taught courses in programming and data structures.		
Adjunct Faculty	Orange Coast College	1/2008–5/2010
Taught courses in algebra, calculus, differential geometry, topology and the theory of computation.		

Education

PhD in Computer Science	University of California, Irvine	2015
Topic: graph drawing and network visualization. Advisor: David Eppstein.		
MA in Mathematics	University of California, Los Angeles	2007
Emphasis: abstract algebra and mathematical logic. Jointly earned with BS.		
BS in Mathematics	University of California, Los Angeles	2007
Summa cum laude. Departmental highest honors. Sherwood Prize in Mathematics. Phi Beta Kappa.		

Selected Projects

Connect-K AI. An AI player for tic-tac-toe, connect-four and generalizations of these games. Uses minimax, alpha-beta and Monte Carlo tree search algorithms.

Graph Drawing Testbed. A tool for entering graphs by hand and experimenting with graph visualization algorithms. Used to design new algorithms for the visualization of social networks.

Ray Tracer. A path-tracing ray tracer written in Python and run on the cloud. Reduced the rendering time through parallel processing using AWS Batch.

Reflections. A webcam utility for remote pair programming. Displays the webcam in a corner of the desktop, thus making it possible for both the webcam and screen to be shared at the same time through video chat.

Selected Research

Randomized speed up of the Bellman-Ford algorithm. A variant of the Bellman-Ford algorithm which is faster than the previously-best variant (Yen, 1970) by a factor of $2/3$ in expectation with high probability.

Windows into relational events. Data structures for the analysis of timestamped relational events in social networks, supporting common counting queries on the subgraphs formed by the events in a given time interval.

Confluent orthogonal drawings of syntax diagrams. An algorithm and implementation for producing a syntax diagram from a context free grammar. The syntax diagram is optimized for several legibility criteria.

Languages and Technologies

Languages: C++, C, Java, Python, JavaScript, MATLAB, SageMath, HTML, CSS, LaTeX

Libraries: SDL, JavaFx, NumPy, wxPython, NetworkX, Flask, Electron, React

Tools: Vim, IntelliJ IDEA, Visual Studio, GDB, Valgrind, ASan, UBSan, Git, Linux, MongoDB