

# CRAIG S. KAPLAN

Box 352350  
University of Washington  
Seattle, Washington  
98195-2350 USA

*csk@cs.washington.edu*  
Home: (206) 545-4334  
FAX: (206) 543-2969  
<http://www.cs.washington.edu/homes/csk/>

## EDUCATION

PhD, Computer Science & Engineering, University of Washington, June 2002 (expected).

Dissertation topic: Computer graphics and geometric art. Throughout history, humanity has been driven to decorate architectural surfaces with geometric patterns. Artists have explored the use of geometry in art. I show how modern geometry and computer graphics may be used to express these artistic and ornamental traditions (Advisor: David Salesin).

MS, Computer Science & Engineering, University of Washington, 1998.

Qualifying project: *The Analysis and Generation of Escher-Style Tilings* (Advisor: David Salesin).

BMath, Double Honours Computer Science & Pure Mathematics CO-OP, University of Waterloo, 1996.

## TEACHING EXPERIENCE

### University of Washington

Seattle, Washington

#### Instructor

Co-taught CSE457, Introduction to Computer Graphics, 80 senior undergraduates, 1999.

Taught CSE143, Introduction to Computer Programming II, 85 undergraduates, 1998.

#### Teaching Assistant

Head TA for CSE457, Introduction to Computer Graphics, 1998.

TA for CSE590IT, Graduate TA Training, 1997.

TA for CSE341, Introduction to Programming Languages, winter & spring 1997.

TA for CSE143, Introduction to Computer Programming II, 1996.

#### Undergraduate Supervisor

Supervised an undergraduate student in a senior project in computer graphics, 1999.

#### Tutor

Provided volunteer one-on-one tutoring for students in CSE341, Introduction to Programming Languages, 1998 & 2001.

## PROFESSIONAL EXPERIENCE

### University of Washington

Seattle, Washington

Research Assistant, Computer Graphics (advisor: David Salesin), since 1997

Developed a technique for constructing Islamic star patterns in Euclidean and non-Euclidean geometry. Executed star patterns in a variety of media using computer-controlled manufacturing hardware.

Created a system for discovering Escher-like tessellations based on arbitrary user-supplied shapes.

Explored novel ornamental uses of tilings, polyhedra, and Voronoi diagrams.

Research Assistant, Programming Languages (advisor: Craig Chambers), 1996-1998

Developed predicate dispatching as a generalization of the many dynamic dispatch mechanisms of different programming languages. Created an interpreter for a simple object-oriented language incorporating predicate dispatching.

## PROFESSIONAL EXPERIENCE (CONTINUED)

### Microsoft Research

Redmond, Washington

Researcher, 1999

Investigated profile-driven optimization techniques to improve locality of data reference.

### Alias|Wavefront

Toronto, Ontario and Seattle, Washington

Graphics Software Engineer, 1994-1997 (five internships)

Redesigned, reimplemented and optimized OpenModel, a C++ class library allowing offline access to PowerAnimator model files; created a live plug-in interface for PowerAnimator based on OpenModel.

Integrated a third-party Scheme interpreter library into PowerAnimator.

### WATCOM International Limited

Waterloo, Ontario

Software Researcher and Developer, 1992-1993 (two internships)

Created international versions of compiler tools for Japanese-BIOS machines running in English and Japanese.

Researched link-time optimization techniques to reduce memory usage on portable devices.

## PUBLICATIONS

### *Journal Articles*

Erik D. Demaine, Martin L. Demaine and Craig S. Kaplan. Polygons Cuttable by a Circular Saw. In *Computational Geometry: Theory and Applications*, volume 20, number 1-2, October 2001. (A previous version appeared in *Proceedings of the 12th Annual Canadian Conference on Computational Geometry (CCCG 2000)*. Fredericton, New Brunswick, Canada, 16-18 August, 2000.)

### *Conference Papers*

Craig S. Kaplan and David H. Salesin. Islamic Star Patterns in Absolute Geometry. In preparation for SIGGRAPH 2002.

Craig S. Kaplan and George W. Hart. Symmetrohedra: Polyhedra from Symmetric Placement of Regular Polygons. In Reza Sarhangi, editor, *Proceedings of Bridges 2001, Mathematical Connections in Art, Music and Science*. Winfield, Kansas, USA, 27-29 July 2001.

Craig S. Kaplan. Computer Generated Islamic Star Patterns. In Reza Sarhangi, editor, *Proceedings of Bridges 2000, Mathematical Connections in Art, Music and Science*. Winfield, Kansas, USA, 28-30 July 2000.

Craig S. Kaplan and David H. Salesin. Escherization. In *Proceedings of SIGGRAPH 2000, the 27th International Conference on Computer Graphics and Interactive Techniques*. New Orleans, Louisiana, USA, 25-27 July 2000.

Craig S. Kaplan. Voronoi Diagrams and Ornamental Design. In *Proceedings of ISAMA '99, the first annual symposium of the International Society for the Arts, Mathematics, and Architecture*. San Sebastián, Spain, 7-11 June 1999.

Michael D. Ernst, Craig S. Kaplan and Craig Chambers. Predicate Dispatching: A Unified Theory of Dispatch. In *Proceedings of ECOOP'98, the 12th European Conference on Object-Oriented Programming*. Brussels, Belgium, July 20-24, 1998.

## HONOURS

### *Graduate*

Grand Prize, 2000 ACM/IBM Quest for Java programming contest.  
Honourable mention, 2000 College of Engineering Art Contest.  
Fonds FCAR fellowship, 1997-1998.  
Educator's Fellowship, 1997.  
Bob Bandes Teaching Award for excellence as a teaching assistant, 1997.  
NSERC Postgraduate Scholarship (declined), 1996.

### *Undergraduate*

Valedictorian, University of Waterloo Mathematics, 1996.  
Féjer-Aczel Mathematics Award, 1995.  
Microsoft Technical Scholarship, 1993 & 1995.  
Electrohome 75th Anniversary Scholarship, 1995.  
Canada Scholarship, 1991.  
Descartes Scholarship, 1991.

## PROFESSIONAL ACTIVITIES

### *Professional Development*

Invited participant and speaker at G4G5, the Fifth Gathering for Gardner, 2002.  
Organizer for MOSAIC 2000, Millennial Open Symposium on the Arts and Interdisciplinary Computing, 21–24 August 2000, Seattle, Washington. Worked on all aspects of conference organization and execution.  
Participant in Exploring Faculty Careers, a course offered by the University of Washington Graduate School as part of a Pew Trust Preparing Future Faculty grant, 2000.  
Referee for SIGGRAPH, NPAR, and Bridges conferences.  
ACM student member, since 1997.

### *Service*

Hiring committee for lead undergraduate advisor, 2001.  
Graduate admissions committee, 2001.  
Hiring committee for lead graduate advisor, 2000.  
Bob Bandes Teaching Award selection committee, 1998.  
Curriculum committee, 1997-1999  
Prospective student committee, 1997-1998.