

Richard C. Davis

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Research Interests

Human-Computer Interaction, Computer Graphics, Animation, Design Tools

Education

University of California, Berkeley, CA, USA

- PhD in Computer Science, December 2008
Dissertation: *K-Sketch: A “Kinetic” Sketch Pad for Novice Animators*
Advisors: James A. Landay and John F. Canny

Massachusetts Institute of Technology, Cambridge, MA, USA

- MEng in Electrical Engineering and Computer Science, June 1995
Thesis: *Functional Testing of ASICs (Application Specific Integrated Circuits) Designed with Hardware Description Languages*
- BS in Computer Science and Engineering with a minor in Theater Arts, June 1995

Employment

Singapore Management University, Singapore

Assistant Professor of Information Systems – January 2009 to present

- Plan and execute HCI and Graphics research projects
- Teach courses in software engineering and HCI

Microsoft Corporation, Redmond, WA, USA

Research Intern – June 2004 to September 2004

- Designed and implemented “SketchWizard,” which allows designers with no programming experience to create Wizard of Oz prototypes of pen-based applications.

The MathWorks, Inc., Natick, MA, USA

Design Automation UI Engineer – September 2001 to October 2002

- Prototyped new signal viewing interfaces for *Simulink*, a dynamic systems simulation tool. Modified the simulation engine’s core to support this new interface. Assisted the Matlab team in porting Simulink to MacOS X.

Artel Software, Inc., Boston, MA, USA

Software Engineer – January 2001 to September 2001

- Added international language support and exporters for AVI and Flash file formats to the *BorisFX* family of products. Worked on cross-platform user interface issues and integration issues with external hosts such as Discreet Edit.

Virtual Ink Corporation, Boston, MA, USA

Business Development Manager – January 2000 to October 2000

- Monitored approximately 200 e-Learning and e-Conferencing companies, developed partnership strategies for 40 companies, and created a new e-commerce sales channel with two companies.
- Wrote proposals for products needed to forge partnerships.

Software Architect – October 1998 to January 2000

- Developed interfaces and graphics algorithms for the *mimio* note-taking software and *mimioMouse* projector calibration software.
- Led interface design and user testing teams for the *mimio*, Handwriting Recognition, and *boardCast* products.
- Led a research team that redesigned the *mimio* software interface to allow editing while preserving meeting capture capabilities.

AT&T Labs Research, Florham Park, NJ, USA

Research Intern – June 1998 to August 1998

- Designed and implemented an audio stream downloading and playback plugin for Netscape as part of the “Jotmail” system. The plugin noted playback position while annotations were being typed or drawn and used these annotations to index the audio stream.

FX Palo Alto Laboratory, Palo Alto, CA, USA

Research Intern – June 1997 to August 1997

- Led the design and implementation of “NotePals,” a groupware system that merged handwritten notes and increased awareness of group thoughts and experiences.

Intel Corporation, Santa Clara, CA, USA

Component Design Engineer – August 1995 to August 1996

- Performed quality studies of electromigration checking tools and developed new tools that sped up the checking process by improving the user interface.

Teaching Experience

Full Courses

IS 707: Human-Computer Interaction

Assistant Professor

Singapore Management University, Singapore – Spring 2011

- New graduate course teaching basic HCI concepts.

IS 203: Software Engineering

Assistant Professor

Singapore Management University, Singapore – Fall 2010

- Topics: software project management and web application programming (JSP)
- Team project: design and build an online course bidding system
- Managed one instructor, two teaching assistants, and two sections of 71 students total
- Student Rating 3.9/5.0

IS 706: Engineering Software Systems

Assistant Professor

Singapore Management University, Singapore – Spring 2010

- New graduate course blending HCI, software engineering, ubiquitous system engineering.
- Designed and delivered HCI content of the course.

IS 203: Software Engineering

Assistant Professor

Singapore Management University, Singapore – Fall 2009

- Team project: design and build a restaurant search portal
- Managed one instructor, three teaching assistants, and three sections of 105 students total
- Introduced new HCI content on prototyping methods and heuristic evaluation
- Student Rating 4.0/5.0

IS 303: Architectural Analysis

Instructor (assisting Kevin Steppe)

Singapore Management University, Singapore – Spring 2009

- Topics: architectural issues for web systems (e.g., load balancing, messaging, concurrency)
- Team project: plan new software systems for a fictitious airline
- Assisted with lecturing, tutoring, and grading two sections with 84 students total
- Student Rating 3.9/5.0

CSE 303: Concepts and Tools for Software Development

Lecturer

University of Washington, Seattle, WA – Autumn 2006

- Topics: using Unix shells, scripting, compilers (C/C++), debuggers, profilers
- Managed two teaching assistants and 55 students total
- Introduced Subversion version control and upgraded treatment of C++
- Web page: <http://www.cs.washington.edu/education/courses/cse303/06au/>
- Student Rating 3.7/5.0

CSE 490jl: User Interface Design, Prototyping, and Evaluation

Teaching Associate (assisting James Landay)

University of Washington, Seattle, WA – Autumn 2004

- Topics: design, prototyping, and evaluation of user interfaces
- Team project: prototype and evaluate a location-enhanced or digital home application
- Ran weekly discussion section, purchased and configured course software, graded, guest lectured, mentored project teams
- Web page: <http://www.cs.washington.edu/education/courses/490f/04au/>
- Student Rating 4.9/5.0

CS 184: Computer Graphics

Graduate Student Instructor (assisting Professors David Forsyth and James O'Brien)

University of California, Berkeley, CA – Spring 2003

- Topics: clipping, modeling, rendering, graphics pipelines, and interface issues
- Team project: design and develop a 3D graphical application
- Ran weekly discussion section, prepared programming assignments, graded, mentored project teams
- Student Rating 4.3/5.0

Guest Lectures

GEK 1501: Information Technology and Us

K-Sketch: Kinetic Sketching for Novices

National University of Singapore, Singapore – September 30, 2010

CS 4249: Design of Advanced User Interfaces

K-Sketch: A “Kinetic” Sketch Pad for Novice Animators

National University of Singapore, Singapore – October 19, 2009

IMT 540a: Design Methods for Interaction and Systems

K-Sketch: A “Kinetic” Sketch Pad for Novice Animators

University of Washington, Seattle, WA – October 15, 2008

ENGR 100: Introduction to Engineering Design

The Software Industry: A Personal Whirlwind Tour

University of Washington, Seattle, WA – April 16, 2004

CS 160: User Interface Design, Prototyping, and Evaluation

Usability in the Trenches

University of California, Berkeley, CA – October 29, 2003 & November 4, 2002

Honors

- Graduate Assistance in Areas of National Need (GAANN) Fellowship, 1996-1997
- Honorable Mention for National Science Foundation Graduate Fellowship, 1995

Publications

Refereed Journal Publications

James A. Landay and Richard C. Davis. Making sharing pervasive: Ubiquitous computing for shared note taking. *IBM Systems Journal*, vol. 38, no. 4, 1999, pp. 531-550.

Refereed Conference and Symposium Publications

Rubaiat Habib Kazi, Kien-Chuan Chua, Shengdong Zhao, Richard C. Davis, and Kok-Lim Low. SandCanvas: A Multi-touch Art Medium Inspired by Sand Animation. To appear in *Proceedings of CHI 2011*, Vancouver, BC, Canada, May 7-12, 2011. [26% acceptance rate]

Richard C. Davis, Brien Colwell, and James A. Landay. K-Sketch: a “kinetic” sketch pad for novice animators. *Proceedings of CHI 2008*, Florence, Italy, April 5-10, 2008, pp. 413-422. [22% acceptance rate]

Richard C. Davis, T. Scott Saponas, Michael Shilman, and James A. Landay. SketchWizard: Wizard of oz prototyping of pen-based user interfaces. *Proceedings of UIST 2007*, Newport, RI, October 7-10, 2007, pp. 119-128. [17 % acceptance rate]

Richard C. Davis and James A. Landay. Informal animation sketching: Requirements and design. *Proceedings of AAAI 2004 Fall Symposium on Making Pen-Based Interaction Intelligent and Natural*. Arlington, VA, October, 2004, pp. 42-48. [69% acceptance rate]

Daniel L. Odell, Richard C. Davis, Andrew Smith, and Paul K. Wright. Toolglasses, marking menus, and hotkeys: a comparison of one and two-handed command selection techniques. *Proceedings of Graphics Interface 2004*, London, Ontario, Canada, May, 2004, pp. 17-24. [38% acceptance rate]

Steve Whittaker, Richard Davis, Julia Hirschberg, Urs Muller. Jotmail: A voicemail interface that enables you to see what was said. *Proceedings of CHI 2000*, The Hague, Netherlands, April 2000, pp. 89-96. [19% acceptance rate]

Richard C. Davis, James A. Landay, Victor Chen, Jonathan Huang, Rebecca B. Lee, Francis Li, James Lin, Charles B. Morrey III, Ben Schleimer, Morgan N. Price, and Bill N. Schilit. NotePals: Lightweight note sharing by the group, for the group. *Proceedings of CHI '99*, Pittsburgh, PA, May 1999, pp. 338-345. [25% acceptance rate]

Refereed Demonstrations

Richard C. Davis and James A. Landay. Sketching informal animations with K-Sketch. *The Fourth Eurographics Workshop on Sketch-Based Interfaces and Modeling*. Riverside, CA, August 2007.

Richard C. Davis, James Lin, Jason A. Brotherton, James A. Landay, Morgan N. Price and Bill N. Schilit. A framework for sharing handwritten notes. *Proceedings of UIST '98*, San Francisco, CA, November 1998, pp. 119-120.

Refereed Workshop Position Papers

Richard C. Davis. Playing with Recognizers: A Call for an Extensible Editor. *CHI 2010 Workshop on Designing Sketch Recognition Interfaces*, Atlanta, GA, April 2010.

James A. Landay, Yang Li, and Richard Davis. Activity-based pen computing. *2007 Invited Workshop on Pen-Centric Computing Research*, Brown University, March, 2007.

Richard C. Davis. Informal animation sketching with K-Sketch. *Doctoral Consortium, UIST 2005*, Seattle, WA, October, 2005.

Richard C. Davis and James A. Landay. Forms of expression for designing visual languages for animation. *Graduate Student Consortium, IEEE Symposium on Visual Languages and Human-Centric Computing*, Dallas, Texas, September 2005, pp. 327-328.

Richard C. Davis and James A. Landay. A visual language for animating sketches. *Graduate Student Consortium, IEEE Symposium on Visual Languages and Human-Centric Computing*, Rome, Italy, September 2004, pp. 273-274.

James A. Landay, Richard C. Davis, Victor Chen, Jonathan Huang, Rebecca B. Lee, Francis Li, James Lin, Charles B. Morrey III, and Ben Schleimer. NotePals: Sharing and synchronizing handwritten notes with multimedia documents. *Handheld CSCW Workshop, CSCW '98*, Seattle, WA, Nov. 1998.

Unrefereed Publications

Richard C. Davis. K-Sketch: A Kinetic Sketch Pad for Novice Animators, Unpublished doctoral dissertation, Technical Report UCB/EECS-2008-171, EECS Computer Science Division, University of California, Berkeley, CA, December 2008.

Brien Colwell, Richard C. Davis, and James A. Landay. A study of early stage game design and prototyping. Technical report UW-CSE-08-10-03, Computer Science and Engineering Department, University of Washington, Seattle, WA, October 2008.

Richard C. Davis and James A. Landay. An exploration of lightweight meeting capture. Technical report UCB/CSD-98-1015, EECS Computer Science Division, University of California, Berkeley, CA, May 1998.

Richard C. Davis, Jason A. Brotherton, James A. Landay, Morgan N. Price, and Bill N. Schilit. NotePals: Lightweight note taking by the group, for the group. Technical Report UCB//CSD-98-997, CS Division, EECS Department, UC Berkeley, Berkeley, CA. February 1998.

Jason A. Brotherton, Richard C. Davis, James A. Landay, Morgan N. Price, and Bill N. Schilit. Sharing free-form ink through the web. Technical Report FXPAL-TR-97-022, FX Palo Alto Laboratory, September 1997.

Richard C. Davis. *Functional Testing of ASICs Designed with Hardware Description Languages*. Master's Thesis. Massachusetts Institute of Technology, Electrical Engineering and Computer Science Department. May 1995.

George A. Boughton, Greg Papadopoulos, Bob Greiner, Satoshi Asari, Steve Chamberlin, Jack Costanza, Richard Davis, Thomas Deng, Tom Durgavich, Doug Faust, Eric Heit, Tom Klemas, Jimmy Kwon, Wing Chi Leung, Elizabeth Ogston, Gowri Rao, and Ralph Tiberio. Arctic user's manual. CSG Memo 353, Computation Structures Group, MIT Laboratory for Computer Science, MIT, Cambridge, MA, February. 1994.

Patents

Yonald Chery, Richard C. Davis, Andrew Kelley, III, William P. Moyne, Matthew D. Verminski. *Detector Assembly for Use in a Transcription System*. United States Patent 6,232,962, Assigned to Virtual Ink Corporation, June 7, 2000.

Research Grants Received

MDA/GAMBIT (SG), 2010. Prototyping Video Games with Animation, 150,000 SGD.

National Science Foundation (USA), 2007. SGER: End-User Sketching of Games and Simulations (authored grant for P.I. James Landay), 142,281 USD.

Talks

Conference and Workshop Presentations

Playing with Recognizers: A Call for an Extensible Editor. CHI 2010 Workshop on Designing Sketch Recognition Interfaces, Atlanta, GA, April 11, 2010.

SketchWizard: Wizard of Oz Prototyping of Pen-Based User Interfaces. UIST 2007, Newport, RI, October 2007.

Informal Animation Sketching with K-Sketch: The Kinetic Sketch Pad. UIST 2005 Doctoral Consortium, Seattle, WA October 2005.

Choosing Animation Features in K-Sketch. VL/HCC 2005 Graduate Student Consortium, Dallas, TX, September 2005.

A Visual Language for Animating Sketches. VL/HCC 2004 Graduate Student Consortium, Rome, Italy, September 2004.

Informal Animation Sketching: Requirements and Design. AAAI Fall Symposium on Making Pen-Based Interaction Intelligent and Natural, Alexandria, VA, October 2004.

Invited Talks

K-Sketch: Kinetic Sketching for Novices. Learning Sciences and Technologies Academic Group, National Institute of Education, Nanyang Technological University, Singapore, February 23, 2010.

Human-Computer Interaction: The Wild Frontier of Information Technology. School of Information Systems, Singapore Management University, Singapore, December 8, 2009.

The Non-human Actor and the Attraction of Animation (panel), Social Sciences Capstone Seminar: Action, Agency, Agendas, and Activisms, Singapore Management University, Singapore, September 22, 2009.

K-Sketch: A “Kinetic” Sketch Pad for Novice Animators. School of Computing, National University of Singapore, Singapore, February 25, 2009.

K-Sketch: A “Kinetic” Sketch Pad for Novice Animators. Adaptive Systems and Interaction Group, Microsoft Research, Redmond, WA, September 25, 2008.

K-Sketch: A “Kinetic” Sketch Pad for Novice Animators. School of Interactive Computing, Georgia Institute of Technology, Atlanta, GA November 2007.

Media Coverage

Celeste Biever. Easy animation to get novices jumping for joy. *New Scientist*, issue 2524, November 5, 2005, p 26.

Professional Affiliations and Activities

Conference Committees

- UIST: ACM Symp. on User Interface Software & Technology: *Student Volunteer Chair* (1998)
- VL/HCC Workshop on Sketch Tools for Diagramming: *Program Committee* (2008)

Conference Staff

- Microsoft Research/Brown Univ./DTO 2007 Invited Workshop on Pen Computing: *Scribe*
- Univ. of Washington and Microsoft Research 2005 Faculty Tablet PC Workshop: *Scribe*

Referee/Reviewer

- CHI: ACM Conference on Human Factors in Computing Systems (2005,2007–2011)
- Computer-aided Design and Applications Journal (2010)
- IEEE Computer Graphics and Applications (2010)
- ACM Creativity and Cognition Conference(2009)
- CSCW: ACM Conference on Computer Supported Cooperative Work (2004)

- Graphics Interface Conference (2005, 2008)
- IUI: International Conference on Intelligent User Interfaces (2008)
- SIGGRAPH (2007, 2008) and SIGGRAPH Asia (2010)
- IEEE Software Journal (2009)
- ToCHI: ACM Transactions on Computer-Human Interaction (2010)
- Journal of Visual Languages and Computation (2009)
- UIST: ACM Symposium on User Interface Software and Technology (1998,2004–2010)

Campus and Academic Service

- **UC Berkeley Group for User Interface Research:** *Weekly Meeting Coordinator (1997-1998)*
- **UC Berkeley Computer Science Graduate Student Association:** *Social chair (1997-1998)*
- **UC Berkeley Soda Hall (CS Division) Safety Committee:** *Member (1997-1998)*

Student Advising

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|------------------------------|-----------------|--------------------|-----|---------------------------|
| • Shu Ke | Graduate | <i>Taxi</i> | SMU | Fall 2010 – present |
| • Rubaiat Habib Kazi | Graduate | <i>SandCanvas</i> | NUS | Spring 2010 – present |
| • Kawin Boonyapredeee | Graduate | <i>StorySketch</i> | SMU | Spring 2010 – Winter 2010 |
| • Guan Mengyuan | Research Fellow | <i>StorySketch</i> | SMU | Spring 2010 – Spring 2011 |
| • Zhang Rui | Research Fellow | <i>StorySketch</i> | SMU | Spring 2010 – Winter 2010 |
| • Brien Colwell | Undergraduate | <i>K-Sketch</i> | UW | Fall 2007 – Spring 2009 |
| • Matthew Davis | Undergraduate | <i>K-Sketch</i> | UW | Fall 2005 – Spring 2007 |
| • Cy Khormae | Undergraduate | <i>K-Sketch</i> | UW | Fall 2005 – Spring 2006 |

Other Activities

Theater Interest

- Acted in fifteen stage plays and two short films (1989 to 2005)
- Stage managed two stage plays and produced one stage play
- Served as vice president of the MIT Dramashop in 1993-1994
- Received MIT's Ed Darna Award for contribution to Theater Arts in 1995

Music Interest

- Member of numerous choirs (1985 to 2009)
- Performed in five musical theater productions

Social Action Interest

- Volunteer projects, including computer help for the homeless and disadvantaged, math tutoring for prisoners, and cooking in a soup kitchen.

Citizenship

United States Citizen