

Dr. Debra Lee Davis

School of Computing &
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CS EDUCATION RESEARCH

HUMAN COMPUTER INTERACTION

- **Student-oriented mentor** with an interactive, hands-on approach; works with students to enhance their strengths and overcome their weaknesses, helping them excel in their studies and careers
- Articulate and engaging speaker and author with **excellent written and oral communication skills**; able to present to and engage even large groups consisting of both technical and non-technical audiences
- **Former Computer Executive and Influential leader** who works well with both technical and cross-functional teams, facilitating partnering between diverse individuals, departments and organizations
- Strong **Experimental Design & Research Methodology, Grantsmanship, CS and Research Management and Advanced Statistical Analysis Expertise**

EDUCATION

Ph.D., Cognitive Developmental Psychology, minor: **Statistics**, University of Texas at Austin, 2004

M.S., Computer Science, Florida International University (FIU), 2000

M.A., Developmental Psychology, minor: **Statistics**, University of Texas at Austin, 1996

B.A. with Academic and Research Honors, Psychology, minor: **Computer Science**, FIU, 1993

RESEARCH AND PROFESSIONAL EXPERIENCE

FLORIDA INTERNATIONAL UNIVERSITY (FIU) (Feb. 2010 – Present)

SCHOOL OF COMPUTING AND INFORMATION SCIENCES

NSF INDUSTRY-UNIVERSITY COOPERATIVE RESEARCH CENTER AT FIU AND FAU

Instructor (Aug. 2014 – present)

Adjunct Faculty Member (Aug. 2013 - Aug. 2014)

Postdoctoral Faculty Associate (Dec. 2010 – Aug. 2013)

Scope: I.T. and STEM research initiatives and grantsmanship for large-scale NSF technology grant initiatives and other Federal grant opportunities, internal and external grant proposal and professional publication review and analysis; write book chapters, articles and other professional publications. Design, Develop and Teach Computer Science courses, including engaging in new and innovative approaches for improving student outcomes. Areas of focus include **Computer Science STEM Education Research, Human-Computer Interaction and User Experience and Usability Research** initiatives.

- **Co-Principle Investigator:** \$615,000 NSF IUSE Level II technology STEM grant
- **Co-Principle Investigator:** \$210,000 NSF IUSE Level I Collaborative Learning STEM grant
- **Co-Principle Investigator:** \$218,000 NSF EAGER technology cybersecurity grant
- **Co-Principle Investigator:** \$600,000 NSF TUES technology STEM grant (ended 2016)
- First Author on 2 **Computer Science STEM Education** conference papers (*ASEE 2017 and EEE 2016 Proceedings*)
- Co-Authored 2 **Computer Science STEM education** journal articles (*ACM Transactions on Computing Education (TOCE)*)
- Co-Authored 6 **Computer Science STEM Education** conference papers (*ACM SIGCSE and ASEE proceedings*)
- Co-authored 2 collaborative book chapters on **Data Intensive Computing**
- **Discussion Leader** for the **SIGCSE 2014 BOF: Including HCI and User Experience (UX) Methodologies in Computing Curriculum**

- **Discussion Leader** for the **SIGCSE 2013 BOF: Including HCI and User Experience (UX) Methodologies in Computing Curriculum**
- **Courses taught:**
 - Programming I
 - Human Computer Interaction
 - Data Structures
 - Advanced Topics in Information Processing (Guest Co-Instructor)
 - Advanced Database Systems (Guest Co-Instructor)

DEPARTMENT OF PSYCHOLOGY, FIU

Digital Instructor (Aug. 2013 – Aug. 2014)

Adjunct Faculty Member (Jun. 2010 – Aug. 2013)

Research & Technical Consultant, CHILD ANXIETY AND PHOBIA PROGRAM (CAPP) (2010)

Scope: Analyze, design and implement processes and strategies to improve effectiveness of CAPP research and outreach goals: (1) Provided analysis and design recommendations for technology improvements (online assessment capabilities, website redesign and internal collaboration), and (2) Analyzed, designed and implemented participant recruitment, enrollment and retention strategies for research and clinical trials.

- Tripled participant recruitment & doubled participant enrollment during traditionally slowest months
- **Courses Taught**
 - Research Methods
 - Social & Personality Development
 - Psychology of Health and Illness
 - Introduction to Psychology
 - Human Growth & Development
- **Evaluator** for the **SIGCSE 2014 Workshop: Integrating Software Testing into Programming Courses**

NOA INC DBA TERRAFLY INC (Jun. 2012 – Dec. 2013)

Senior Scientist

Scope: Principle Investigator for three technology transfer and commercialization National Science Foundation (NSF) Small Business Innovation Research awards (SBIR):

- \$150,000 **NSF SBIR I** technology grant
- \$30,000 **NSF SBIR IB** technology grant
- \$750,000 **NSF SBIR II** technology grant
- Incorporated and engaged in **User Experience Research** and **Design methodologies** into the design and development lifecycle of a large, location-based visualization system that incorporates multiple types of GIS and real-time multimedia data.

THE CHILDREN'S TRUST

Chief Information Officer (Feb. 2006 – Aug. 2009)

Senior Research & Evaluation Analyst

Scope: Provided the vision, leadership, strategic planning and management of the Information Systems Department. Ensured the alignment of information systems and data-driven initiatives with enterprise objectives and goals, including leading the analysis, design and implementation of data systems and strategies, implementing best practices, providing improved data integrity & security, defining appropriate evaluation metrics, and providing domain expertise and evaluation of research projects and grant proposals. As Sr. Research and Evaluation Analyst, focused on managing the development and execution of all phases of research and evaluation projects.

Main Accomplishments:

- Managed a departmental budget of up to \$1.25 Million.

- Refocused the organization's IS governance from technology-focused to a **User-Centric Research and Design Approach**
- Instituted **User Research and Usability Methodologies** into the development lifecycle, such as *goal-directed research and design, contextual inquiry, focus groups, user survey development, task analysis, cognitive walkthroughs, storyboarding and wireframing*
- Overhauled, identified and **improved integrity and validity of key research data by 90%** via the use of best practices in both Information Technology and research design, including refocusing questions of interest, design of more advanced data structures, and appropriate database constraints
- Saved the organization over \$350,000 in the implementation of an enterprise contract management system via influential negotiation, strong project management skills, best practices, and appropriate use of current and emerging technologies
- Regularly lead complex organization-level and cross-departmental projects that often involved dealing with conflicting and changing priorities, limited resources and severe time constraints
- Regularly engaged in RFP creation, grant proposal reviews, and program funding recommendations
- Supervised and coordinated a team of up to 15 technical and non-technical employees and contractors on departmental and organization-wide initiatives

MIAMI-DADE COUNTY PUBLIC SCHOOLS, ADULT EDUCATION/REGIONAL OPERATIONS

Education Specialist, Part-time (March 2005 – June 2007)

Scope: Designed & implemented database structures, queries, views, forms and reports for research related initiatives. Grantsmanship including grant writing for several successful Department of Education (ED) grants. Analyzed and implemented program evaluation plans and research studies. Conducted statistical data analyses.

UNIVERSITY OF TEXAS AT AUSTIN, DEPARTMENT OF PSYCHOLOGY

Research Lab Coordinator and Research Assistant (1993-1997, 2001-2004)

Scope: Initiate, design and conduct research in Cognitive Developmental Psychology, with a focus on Theory of Mind. This involved the entire life-cycle of the scientific research process including formulating topics of research, investigating and integrating previous research findings, designing and implementing research methodology, performing statistical data analyses, interpreting research results, and communicating study findings to professional and nonprofessional audiences in both oral and written forms.

Main Accomplishments:

- *Dissertation Focus:* (1) Understanding of intelligent artifacts (computers/robots) and their relation to the mind, and (2) Understanding which attributes children and adults most strongly associate with having a mind and a brain
- Executed a broad-based, multi-disciplinary literature review that provided a unified perspective of people's common beliefs about the mind. This work coalesced research not only from diverse areas of Psychology, but also from other disciplines including Cognitive Science, Human-Computer Interaction, Artificial Intelligence, Education, and Media and Communications
- Designed and implemented a multifaceted research methodology capable of being administered to a wide range of ages (5-year-olds to adults), allowing direct statistical comparisons of responses between even young children and adults
- Utilized complex statistical analyses, including Hierarchical Linear Modeling for Repeated Measures Categorical Data, to allow for more detailed and in-depth analysis of study data

NASA REGIONAL APPLICATIONS CENTER (RAC)

HIGH PERFORMANCE DATABASE RESEARCH CENTER, FLORIDA INTERNATIONAL UNIVERSITY (FIU)

Applications Manager (2000-2001)

Scope: As part of a management team, shaped the long-term vision of TerraFly (the Center's flagship project) and the RAC. This included investigating strategic marketing directions, recommending additional growth opportunities, and acting as a representative of the Center with partners and outside agencies.

- Analyzed long-term vision and goals of TerraFly to establish classes of projects suitable for research and implementation
- Designed and developed TerraFly's large scale semantic database to house terabytes of various types of spatial data in one database
- Created an algorithm to more quickly and efficiently retrieve large amounts of spatial data from TerraFly's semantic database
- Researched and analyzed user experience requirements, and provided system and user interface design strategies and improvements for current and future research project implementations
- Managed and coordinated functional requirements and work load between management, technical team leaders and programmers, facilitating cooperation between diverse project teams

Project Manager, TerraFly (1998-2000)

Scope: Promoted to Project Manager for the center's flagship project: Supervised the production of TerraFly, an interactive vehicle for 'flying' over remote sensed and associated data. The project began as a standalone application and evolved into a Web-based system.

- Analyzed, planned and directed short- to mid-term feasibility and implementation goals as well as contributed to TerraFly's long-term vision
- Conducted detailed research and analysis of spatial data for integration into the TerraFly system
- Evaluated research projects and provided feedback to the Center's Director for final evaluation
- Directed a diverse team of researchers and software engineers using C++, Java, JavaScript, CGI and HTML to develop the TerraFly application and related software tools
- Defined functional requirements and created use cases, class diagrams and documentation for the restructuring of TerraFly from a standalone to Web-enabled application
- Created and delivered oral and written technical presentations to both technical and non-technical audiences using a clear and cohesive style

SERVICE

University Service

- Panelist for the College of Arts and Sciences' 3rd Annual Online Teaching Symposium (2014)
- Summer 2013 STEM Workshop Organizer
 - NSF-sponsored FIU Tapestry Workshop (1 of 3 organizers)
 - 2nd Annual FIU STEM Teachers Workshop (1 of 4 organizers)
 - 3rd Workshop on a Web-based Approach to Integrating Software Testing into Programming Courses using WReSTT (1 of 3 organizers)
- Worked with the FIU Library to engage undergraduate students in user experience research—specifically, analysis and user testing of 3 prototypes of their main web page (Spring 2014)
- Organized the Evaluation Team and assisted CFO office efforts (with Tom Gustafson) in revisions to FIU's US DOT TIGER 2014 Award Grant Agreement (Fall 2013 & Spring 2014).

MOST RECENT PUBLICATIONS AND PRESENTATIONS

Davis, D. (2017). Combining Active Learning Approaches for Improving Computing Course Outcomes at Minority-Majority Institutions. *Proceedings of 124th American Society for Engineering Education (ASEE) Annual Conference*, Columbus, OH.

Clarke, P., Davis, D., Chang-lau, R., & King, T. (2017) Impact of Using Tools in an Undergraduate Software Testing Course Supported by WReSTT. *ACM Transactions on Computing Education (TOCE)*, 17, 4, Article 18 (August 2017), 28 pages.

Clarke, P., Davis, D., Chang-lau, R., Fu, Y., Kiper, J., & Walia, G.S. (2017). Using WReSTT Cyberlearning Environment in the Classroom. *Proceedings of 124th American Society for Engineering Education (ASEE) Annual Conference*, Columbus, OH.

Davis, D., Vassigh, S., & and Gallardo, G. (2016). Interdisciplinary Learning Through Collaborative Problem Solving. *Proceedings of the 15th International Conference on e-Learning, e-Business, Enterprise Information Systems, and e-Government (EEE'16)*.

Clarke, P., Davis, D., Chang-lau, R., & King, T. (Accepted). Impact of Using Tools in an Undergraduate Software Testing Course Supported by WReSTT. Conference of the ACM Special Interest Group on Computer Science Education (SIGCSE), Paper Presentation, Seattle, WA.

Clarke, P. J., Davis, D. L., Fu, Y., Kiper, J., & Walia, G. (2016). *Integrating testing into CS/IT courses supported by a cyberlearning environment*. Envisioning the Future of Undergraduate STEM Education: Research and Practice. (Washington DC)

Carbunar, B., Rahman, M., Azimpourkivi, M., & Davis, D. (2016). GeoPal: Friend Span Detection in Social Networks Using Private Location Proofs. *Proceedings of IEEE International Conference on Sensing, Communication and Networking (SECON)*.

Clarke, P., Davis, D., King, T., Pava, J., & Jones, E. (2014). Integrated Testing into SE Courses Supported by a Collaborative Learning Environment. *ACM Transactions of Computing Education (TOCE)*.

Clarke, P. J., Davis, D., Chang-lau, R., & King, T. (2014). Observations on student use of tools in an undergraduate testing class. *Proceedings of 121st American Society for Engineering Education (ASEE) – Software Engineering constituent committee division track (SWECC)*. ASEE. (Paper No. 10123)

Davis, D., Berque, D., Davis, J., Jadud, M., & Resnick, P. Including HCI and User Experience (UX) Methodologies in Computing Curriculum. (2014). Conference of the ACM Special Interest Group on Computer Science Education (SIGCSE) Birds of a Feather (BOF), Atlanta, GA.

Davis, D., Irvine, K., Berque, D., Davis, J., Dorn, B., & Jadud, M. (2013) Including HCI and User Experience (UX) Methodologies in Computing Curriculum.(2013). Conference of the ACM Special Interest Group on Computer Science Education (SIGCSE) Birds of a Feather (BOF).

Clarke, P., Pava, J., Davis, D., King, T., and Hernandez, F. (2012). Using WReSTT in SE Courses: An Empirical Study. *Proceedings of the 2012 Conference of the ACM Special Interest Group on Computer Science Education (SIGCSE)*.

Davis, D.L., (2008). All Star Curriculum Effectiveness Study Executive Summary. *Manuscript provided to and published by MacGraw-Hill Education Division*.

ADDITIONAL PUBLICATIONS AND PRESENTATIONS: COMPUTER SCIENCE

Refereed Conference Publications

Rishe, N., Chen, S.-C., Prabakar, N., Weiss, M.A., Sun, W., Selivonenko, A., & Davis-Chu, D.L. (2001). Terraflly: A High-Performance Web-Based Digital Library System for Spatial Data Access. *Proceedings of the 2001 International Conference on Data Engineering*, pp. 17-19, Heidelberg, Germany.

Davis-Chu, D.L., Prabakar, N., Rishe, N., & Selivonenko, A.. (2000). A System for Continuous, Real-Time Search and Retrieval of Georeferenced Objects. *Proceedings of the 2nd International Conference on Information Reuse and Integration*, pp. 82-85, Honolulu, Hawaii.

Selivonenko, A., Prabakar, N., Rische, N., & Davis-Chu, D.L. (2000). Dynamic Mosaicking of Heterogeneous Digital Images. *Proceedings of the 2nd International Conference on Information Reuse and Integration*, pp. 86-90, Honolulu, Hawaii.

Davis-Chu, D.L., Prabakar, N., & Rische, N. (2000). Client-Server Based Real-Time Integration Of Remotely Sensed And Digital Data. *Proceedings of the 1999 Int'l Conference on Imaging Science, Systems and Technology*, pp. 499-505, Las Vegas, Nevada.

Davis-Chu, D.L., Alvarez, E., & Rische, N. (1999). The Creation of a System for 3D Satellite and Terrain Imagery. *Proceedings of the 13th International Conference in Applied Geologic Remote Sensing, Vol II*, pp. 329-336. Vancouver, British Columbia, Canada.

Davis, D.L. (1998). Creation of 3D Satellite Imagery. *Proceedings of the Workshop on Next Generation Database Design and Applications*, p. 48, Miami, FL.

Refereed Conference Presentations

Rische, N., Gutierrez, M., Gonzales, A., & Davis, D.L. (1999). An Efficient Storage, Analysis, and Retrieval System for SeaWiFS Data using SeaDAS, Sem-ODB technology, and the World Wide Web. *Presentation at the 1999 meeting of ISSSR "Systems and Sensors for the New Millennium"*, October 31, - November 4, 1999, Las Vegas, Nevada.

Internal Technical Manuscripts

Davis-Chu, D.L., Prabakar, N., Rische, N. & Selivonenko, A. (2001). Fast and Efficient Retrieval of Spatial Objects Using Semantic Object-Oriented Database Technology. Internal technical report. NASA Regional Applications Center, High Performance Database Research Center at Florida International University.

Ho, T., Davis-Chu, D.L., Gutierrez, M., Martinez, M., & Rische, N. (1999). Cluster Implementation of a Multi-user, Real-time Spatial Data Viewer Using 'TerraFly' and a Parallel Semantic Database. Internal technical report. NASA Regional Applications Center, High Performance Database Research Center at Florida International University.

ADDITIONAL PUBLICATIONS AND PRESENTATIONS: PSYCHOLOGY

Refereed Journal Publications

Davis, D.L., Woolley, J.D., & Bruell, M. (2002). Young children's understanding of the roles of knowledge and thinking in pretense. *British Journal of Developmental Psychology, Vol. 20(1)*.

Woolley, J.D., Phelps, K.E., Davis, D.L., & Mandell, D.J. (1999). Where theories of mind meet magic: The development of children's beliefs about wishing. *Child Development, Vol 70(3), 571-587*.

Refereed Conference Presentations

Davis, D.L. (2003). Development in children's understanding of what it means to have a mind. *Presentation at the 2003 biennial meeting of the Society for Research in Child Development* in Washington, Tampa, Florida.

Davis, D.L. (1997). Children's understanding of the role of knowledge and thinking in pretense. *Presentation at the 1997 biennial meeting of the Society for Research in Child Development* in Washington, DC.

Davis, D.L., Woolley, J.D., & Bruell, M. (1996). Young children's understanding of the mentalistic nature of pretense. *Presentation at the 1996 annual meeting of The American Psychological Society* in San Francisco, California.

Davis, D.L. (1995). Young children's understanding of pretense as a mental representation. *Presentation at the 1995 biennial meeting of the Society for Research on Child Development in Indianapolis, Indiana.*

Bruell, M., Davis, D.L., & Thomas, J.F. (1995). Young children's understanding of representational diversity in pretense. *Presentation at the 1995 biennial meeting of the Society for Research on Child Development in Indianapolis, Indiana.*

Davis, D.L., Berman, A., Berman, S., Wanderman, J., Briones, E., & Kurtines, W.M. (1993). The Development of a Measure of the Use of Critical Thinking and Discussion in Moral Delimmas. *Paper presentation. Association of Moral Education Conference* in Tallahassee, Florida.

Williamson, S., Berman, S., Davis, D.L., & Kurtines, W.M. (1992). The Development of a Measure of Critical Thinking. *Paper Presentation. Association of Moral Education Conference* in Toronto, Ontario, Canada.

Manuscripts

Davis, D.L. (2003) Everyday ascriptions of the mind: What is the mind, who has one and how do we know that? *Unpublished Manuscript*

OTHER RELATED PUBLICATIONS

Contributing Author to:

- The Children's Trust Annual Report (2006-2008)
- Annual Report to The Children's Trust Board of Directors (2006-2009)
- The Children's Trust Budget Message (2006-2009)
- The Children's Trust Budget Briefing Papers (2006-2009)
- The Children's Trust Annual Report to the Board of the County Commissioners (2006-2008)
- The Children's Trust Community Report Card (2006)