

Chadwick A. Wingrave

<http://people.cs.vt.edu/~cwingrav>
cwingrav@cs.ucf.edu

Research Interests

My range of research interests are rooted in a belief that a computer is a tool to support scientific research, fuel business and enrich social fulfillment, gaming, interaction and art. Because of this, I have focused on 3D interaction, bringing the computer into the human world. More recently, this has been targeting the problems of 3DUI infrastructure for 3D interaction and the use of commodity hardware for everyday 3DUIs. Future work will continue these themes, seeking collaborations to target real-world problems. I strive for creativity, an understanding of theory to guide practical exploration, solid methodology for experimentation and true collaboration with domain experts to solve real problems.

- 3D User Interfaces (3DUI)
- Virtual Reality, Augmented Reality, Tangible Interaction
- Post-WIMP, Reality-Based Interaction
- Usability in Software Engineering and Design
- Human Computer Interaction and Design
- Ubiquitous and Wearable Computing
- Entertainment and Serious Games, Wii
- Biologically inspired computing
- Social impact and artistic usage of technology
- Multi-touch, sketching, tablet PCs

Formal Education

PhD, CS	2003-2008	Virginia Tech	Blacksburg, VA
<ul style="list-style-type: none">• Dissertation: "Concept-Oriented Design in Chasm: Conversational Domain Language Inspired 3D User Interface Design and Development", Advisor: Doug A. Bowman• Committee: Godmar Back (Comp.Sci., Virginia Tech), Carlos Evia (English, Virginia Tech), Robert Jacob (Com.Sci., Tufts University), Manuel Pérez-Quñones (Com.Sci., Virginia Tech)			
PhD Student (no degree)	2001-2003	Georgia Tech	Atlanta, GA
<ul style="list-style-type: none">• Advisor: Larry F. Hodges, Computer Science• Left when adviser went to chair the Department of Computer Science at the U. of North Carolina, Charlotte.			
Masters, CS	May 2001	Virginia Tech	Blacksburg, VA
<ul style="list-style-type: none">• Thesis: "Nuance-Oriented Virtual Environments", Advisor: Doug A. Bowman• Committee: Naren Ramakrishnan (Com.Sci., Virginia Tech), Ron Kriz (Eng. Sci. and Mechanics, Virginia Tech)			
B.S., CS	May 1999	Virginia Tech	Blacksburg, VA

Honors and Awards

- Invited to the 3rd Young Investigator's Forum in Virtual Reality, Pohang, Korea 2005
- Virginia Tech delegate to the Human-Computer Interaction Consortium (HCIC) conference, 2004
- Outstanding Masters Research Award, Virginia Tech, Computer Science, 2001
- North American Champions, 2nd place intl., ACM International Programming Competition, Assistant Coach, 2001
- 1st and 2nd place finishes, ACM Mid-Atlantic Region Programming Competition, Assistant Coach, 1998-2001
- Department Service Award, Virginia Tech, 1999

Professional Experience

- Postdoctoral Researcher, University of Central Florida** **2008+**
ISUE Lab - Interactive Systems and User Experience Lab
- Research in post-WIMP desktop interaction, serious games, pen and multi-touch interaction, gesture, Nintendo Wii
 - Explored the design of the Intelligence Analyst's workstation of the future, funded by IARPA.
- Ford Motor Company, Senior Usability Specialist** **2006-2008**
Creative Design and Usability
- Experienced the software engineering process in a large organization. Worked with multiple project teams of artists, analysts and engineers to refine requirements, data architecture, business workflow and app. interface.
 - Performed usability engineering's best practices on a daily routine such as wireframing, heuristic and expert evaluations, patterns, use-cases and accessibility
 - Managed Usability Specialists on several projects with multi-million dollar usability budget as well being assigned to non-traditional or problem projects.
- Graduate Research Assistant, Virginia Tech** **Fall 2003-2006**
iDesign – Domain Specific Interaction in Virtual Environments
- Used the domain of Building Construction to motivate 3D interaction under Doug Bowman, Virginia Tech.
 - Worked specifically on the above ceiling component, funded by NSF
- Department of Veteran's Affairs, Research Scientist** **Summer 2003**
Navigation by Wearable Interfaces for the Blind
- Built a wearable computer navigational device, fusing multiple sensors, for those with little to no vision.
- Graduate Research Assistant, Georgia Tech** **Fall 2001-2003**
Balance NAVE
- A Virtual Reality tool for the research and rehabilitation of balance disorders. Worked under Larry Hodges of Georgia Tech and with the collaboration of doctors at the Pittsburgh Medical Center.
- Graduate Research Assistant, Virginia Tech** **Summer II/ Fall 2000**
Usability in Virtual Environments
- Researched 3DUI system control and selection tasks under Doug A. Bowman, Virginia Tech.
- Graduate Research Assistant, Virginia Tech** **Spring/Summer I 2000**
Bioinformatics
- Collaborated with multiple Biology and Computer Science researchers at Virginia Tech, University of North Carolina and Rockefeller University in the management and visualization of loblolly pine MicroArray and gene expression data.
- NationsBank (now Bank of America), Summer Intern** **Summer 1998**
BINTOM: Database Theory Research
- Researched end-user database modeling and built and evaluated an end-user database-modeling tool.
- Coast Guard Operations Systems Center, Junior Programmer/Analyst** **Summer 1997**
Fuentez Systems Concepts (Head Contractor)
- Ported, patched and performed code recovery on Coast Guard mission critical SAR system HERMES
- Conquest Productions, Co-Founder** **1995-1996**
Internet Publishing and Content Design
- Co-founded an Internet publishing and design company during the Internet boom. Created several websites for businesses as well as service sites for individuals seeking jobs and companies posting positions.

Research Grants, Proposals and Contracts

“Enhancing Creativity and Authoring in STEM Education-Based Virtual Worlds through Concept-Oriented Design”, (2009) Joseph J. LaViola Jr. (PI), **Chadwick Wingrave**, Clint Bowers, Jan Cannon-Bowers, NSF CreativeIT, \$755,845.

“Prototyping Tools for Unobtrusive Mood Assessment” (2009), Joseph J. LaViola Jr. (PI), **Chadwick A. Wingrave**, US Army Research, Development and Engineering Command (RDECOM), \$150,000.

Graduate Research Development Project (2004), Graduate Student Assembly, \$375.

Publications

BOOK CHAPTERS:

- Stuetzlinger, W. and **Wingrave, C.** (2009) “The Value of Constraints for 3D User Interfaces.” In *Virtual Realities - Dagstuhl Seminar*, Springer.
- **Wingrave, C.** The Future Virtual Reality Melting Pot. In Sanchez-Segura, M. (Ed.), *Developing Future Interactive Systems*, Idea Group Publishing, 2004.

PANEL AND WORKSHOP ORGANIZATION:

- Workshop Co-Organizer: “AP-3DUI: Towards Adaptation and Personalization in 3D User Interfaces to Enhance User Interaction and Accessibility” IEEE Virtual Reality 2009. Joan De Boeck, Johanna Renny Octavia, Lode Vanacken, **Chadwick A. Wingrave**
- Panel Organizer: “Mixed Reality Interfaces: the Continuum from Virtual to Augmented Reality.” IEEE Virtual Reality 2003. Panelists: Doug A. Bowman (Virginia Tech), Steven K. Feiner (Columbia University), Dieter Schmalstieg (Graz University of Technology), Mark Mine (Disney) and Edward Swan (Naval Research Labs)

REFEREED JOURNALS:

- **Wingrave, C.** and LaViola, J. (to appear) “Reflection on the Design and Implementation of Virtual Environments.” Special Issue of Presence: Teleoperators and Virtual Environments: Reflections on the Design and Implementation of Virtual Environment Systems.
- **Wingrave, C.**, Williamson, B., Varcholik, P., Rose, J., Miller, A., Charbonneau, E., Bott, J. and LaViola, J. “Wii Remote and Beyond: Using Spatially Convenient Devices for 3DUIs” IEEE Computer Graphics and Applications, (to appear).
- **Wingrave, C.**, LaViola, J. and Bowman, D. (accepted with revisions) “A Natural, Tiered and Executable UIDL for 3D User Interfaces Based on Concept-Oriented Design.” Special Issue of ACM Transactions on Computer-Human Interaction (TOCHI), User Interface Description Languages for Next Generation User Interfaces.
- Bowman, D., Chen, J., **Wingrave, C.** et. al. "New Directions in 3D User Interfaces", The International Journal of Virtual Reality, 5(2), 2006, pp. 3-14.
- Bowman, D. **Wingrave, C.**, Campbell, J., Ly, V. and Rhoton, C. “Novel Uses of Pinch Gloves for Virtual Environment Interaction Techniques.” Virtual Reality, 6(3), 2002, pp. 122-129.

REFEREED CONFERENCES:

- Williamson, B., LaViola, J., Miller, A. and **Wingrave, C.** (submitted) “Exploring Natural Interfaces for American Football Video Gaming.” Technote, Symposium of 3DUIs, 2009.
- Leal, A., LaViola, J. and **Wingrave, C.** (2009) “Exploring the Effectiveness of 3D Visualization Techniques for File Searching Tasks.” HCI2009.
- Charbonneau, M. Miller, A. LaViola, J. and **Wingrave, C.** (2009) “Understanding Visual Interfaces for the Next Generation of Dance Based Rhythm Video Games.” SIGGRAPH Sandbox, 2009.
- **Wingrave, C.** “3DUI Flavors Beyond Vanilla.” Software Engineering and Architectures for Realtime Interactive Systems (SEARIS) Workshop at IEEE VR, 2009.
- **Wingrave, C.** and Bowman, D. “Tiered Developer-Centric Representations for 3D Interfaces: Concept-Oriented Design in Chasm.” IEEE Virtual Reality, 2008.

- **Wingrave, C.** “Chasm: A Tiered Developer-Inspired 3D Interface Representation.” CHI Workshop: User Interface Description Languages for Next Generation User Interfaces, 2008.
- **Wingrave, C., Haciahetoglu, Y. and Bowman, D.** “Overcoming World in Miniature Limitations by a Scaled and Scrolling WIM.” 1st IEEE Symposium on 3D User Interfaces, 2006.
- **Wingrave, C.** “Understanding the Limits and Benefits of a 3D Interface Specification.” IEEE VR Workshop on Specification of Mixed Reality User Interfaces, 2006.
- **Wingrave, C. and Bowman, D.** “Baseline Factors for Raycasting Selection.” Proceedings of HCI International, 2005.
- **Wingrave, C., Tintner, R., Waker, B., Bowman, D. and Hodges, L.** “Exploring Individual Differences in Raybased Selection: Strategies and Traits.” IEEE Virtual Reality, 2005.
- **Wingrave, C. and Bowman, D.** “CHASM: Bridging Description and Implementation of 3D Interfaces.” New Directions in 3D User Interfaces Workshop, IEEE Virtual Reality 2005.
- **Chen, J., Bowman, D., Lucas, J. and Wingrave, C.** “Interfaces for Cloning in Immersive Virtual Environments.” Proceedings of the Eurographics Workshop on Virtual Environments, 2004.
- **Wingrave, C., Bowman, D. and Ramakrishnan, N.** “Towards Preferences in Virtual Environment Interfaces.” Proceedings of the Eurographics Workshop on Virtual Environments, 2002, pp. 63-72.
- **Bowman, D., Wingrave, C., Campbell, J. and Ly, V.** “Using Pinch Gloves™ for both Natural and Abstract Interaction Techniques in Virtual Environments.” Proceedings of HCI International, 2001, pp. 629-633
- **Wingrave, C., Bowman, D. and Ramakrishnan, N.** “A First Step Towards Nuance-Oriented Interfaces for Virtual Environments.” Proceedings of the Virtual Reality International Conference, 2001, pp. 181-188.
- **Bowman, D. and Wingrave, C.** “Design and Evaluation of Menu Systems for Immersive Virtual Environments.” Proceedings of IEEE Virtual Reality, 2001, pp. 149-156.

POSTERS:

- **Charbonneau, E., Miller, A., Wingrave, C. and LaViola, J.** “RealDance: An Exploration of 3D Spatial Interfaces for Dancing Games.” Symposium of 3DUIs, 2009.
- **Lucas, J., Bowman, D., Chen, J. and Wingrave, C.** “Design and Evaluation of 3D Multiple Object Selection Techniques.” Symposium of Interactive 3D Graphics and Games, 2005.

OTHER PUBLICATIONS:

- **Wingrave, C.** Methodology for Future 3D Interaction. Young VR 2005.
- **Wingrave, C., Tintner, R., Walker, B., Bowman, D. and Hodges, L.** “Exploring Individual Differences in Raybased Selection: Strategies and Traits.” Human Computer Interaction Consortium, 2004.
- **Wingrave, C., Bowman, D. and Ramakrishnan, N.** “Personalized Nuance-Oriented Interaction in Virtual Environments.” Virginia Tech Department of Computer Science TR-01-24.
- **Wingrave, C., Bowman, D. and Ramakrishnan, N.** “Affordances and Feedback in Nuance-Oriented Interfaces.” Virginia Tech Department of Computer Science Technical Report TR-01-22.

Service to the Profession

- Publications Chair, IEEE Virtual Reality 2010
- International Program Committee Co-Chair, Joint Virtual Reality Conference (EGVE - ICAT – EuroVR) 2009
- Web Chair, IEEE Virtual Reality 2008
- Video Chair, IEEE Virtual Reality 2007
- Lab Presentation Chair and Local Arrangements Chair, IEEE Virtual Reality 2006
- Program Committee, Virtual Reality Software and Technology (VRST) 2009
- Program Committee, IEEE 3D User Interfaces (3DUI) 2009
- Program Committee, Web3D 2008, 2009
- Program Committee, IEEE Virtual Reality 2007, 2008, 2009
- Program Committee, International Symposium on Mixed and Augmented Reality (ISMAR) 2007
- Numerous reviewing assignments and conferences: TOCHI, SIGGRAPH, Journal of Virtual Reality, Computer Graphics and Applications, VRST, etc.
- Judge, ACM Programming Competition, Mid-Atlantic Region, 2003, 2005

- Assistant Coach, Virginia Tech Programming Team, 1998-2001
- Software Contributor: DIVERSE, Simple Virtual Environment (SVE), device drivers for Polhemus Fastrak, Fakespace Pinchgloves, Immersion Cybergloves, 5DT Datagloves, Garmin GPS Units, Talking Lights, Talking Signs

Invited Talks

- “VE User Interface Design and Evaluation”** **2001**
Workshop on Virtual Environments
- With Joe Gabbard, co-taught a one day workshop on Virtual Environments held at Virginia Tech.
- “MAGPIE: What it can do”** **2000**
UNC Chapel Hill
- Presented information about a bioinformatics tool MAGPIE. Tool created by Terry Gaasterland at the Rockefeller University and modified at Virginia Tech.
- Resolution F-98-1: Virtual Reality Development Act 1** **1998**
Virginia Tech Student Government Association (SGA)
- Worked with the SGA to draft a resolution expressing support of Virtual Reality for the students of Virginia Tech when administration restructuring attempted to remove student free access to the CAVE and other resources.
- “HERMES Preliminary Design Review”** **1997**
Coast Guard, Operations Systems Center
- Reported on the workings of the HERMES parser which takes incoming ship position and status messages and places them into the Coast Guard mission critical SAR (Search And Rescue) system.
 - Performed code recovery on system experiencing major code entropy, ported it from an SGI to an HP-UX platform, fixed politically sensitive bugs (to avoid occasional international boat seizures in port), resolved Y2K problems, consulted on future reliability and capacity
- “An Internet Introduction”** **1996**
Rotary Club of Kennett Square, PA
- Asked to discuss the business implications of the Internet
- “The Internet: What You Should Know”** **1996**
Alpha Kappa Psi – Virginia Tech Business Fraternity
- Asked to discuss the business implications of the Internet

Teaching Experience

- Co-taught: CAP6938: 3D User interfaces for Games and Virtual Reality, UCF, 2009
- GTA: CS 4204 Computer Graphics, Virginia Tech
- GTA: CS 5754 Virtual Environments, Virginia Tech
- GTA: CS 4753 Human Computer Interaction, Georgia Tech
- Temporary Replacement Teaching (1 or 2 days each): Operating Systems, Human Computer Interaction, Virtual Reality (graduate level)

Activities

- Michigan Usability Professionals' Association, 2006-2008
- Center for Human-Computer Interaction, Member of Meeting Planning Team, 2005
- Computer Science Graduate Council Member, Virginia Tech, 2001
- Student Representative, Computer Science Undergraduate Program Committee, 1999
- Treasurer, ACM of Virginia Tech, 1999,2001,2002
- Coordinator (and co-founder), CAVE SLUGS (CAVE Student Led Users Group)

- Reader (Literature, Computer Theory/Concepts, Humanities, etc.), writer, music listener, traveler
- Coffee shop aficionado and frequenter