CHERYL STINSON

3D TECHNOLOGIES AND ATHLETICS

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OTTAWA, CANADA

EDUCATION

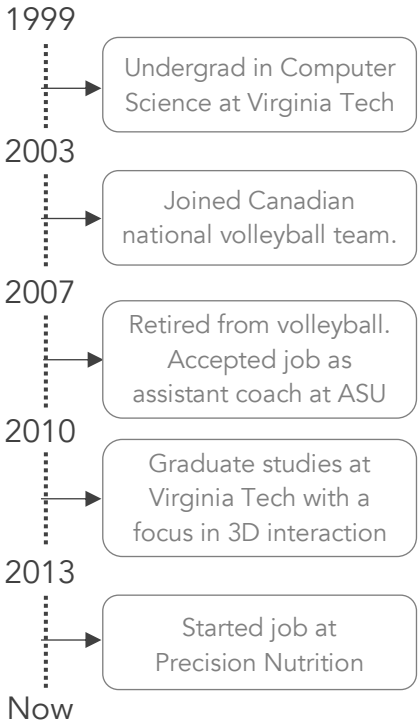
M.S. COMPUTER SCIENCE

Virginia Tech
2010-2013

B.S. COMPUTER SCIENCE

Virginia Tech
1999-2003

CAREER TIMELINE



PROFESSIONAL PROFILE

My career has been a blend of my two greatest interests: athletics and technology. From pro athlete to software developer my career has spanned a wide spectrum. I am passionate about using technology to improve life, with a special interest in 3D technologies for athletic performance.

WORK EXPERIENCE

SOFTWARE DEVELOPER

Precision Nutrition, 2012 – Present

My official role at Precision Nutrition is a full-stack web developer, however my day to day work is a lot more varied. In addition to working on the company's public-facing sites and custom applications, I also regularly act as a technical consultant, coordinate and manage feature development by contractors and agencies, and prepare/execute test plans for the company's multi-million-dollar product launches. I am quick to learn and have a high capacity for detail-oriented work and am regularly tasked with custom features, API integrations, and complex migration projects.

GRADUATE RESEARCH WORK

Virginia Tech, 2010-2013

During my studies I worked on a variety of projects with the 3D Interaction Group. My research centered around using virtual reality (VR) and augmented reality (AR) applications to promote learning, training and sport performance. My coursework spanned the fields of computer science, industrial training, and biomechanics, and my research projects exposed me to a wide variety of 3D displays and tracking systems. I developed many VR applications and ran numerous research studies, all with the end goal of achieving a specialized understanding of how best to use 3D technologies for sport training.

RESEARCH INTERESTS

- Virtual/augmented reality
- Sports biomechanics, sports psychology
- Immersive technologies
- Human learning, human perception
- Human-computer interaction

SKILLS

WEB DEVELOPMENT

- HTML
- CSS
- PHP
- Javascript
- SQL
- Wordpress
- Ruby on Rails

LANGUAGES

- C++
- Java
- Python
- Ruby
- Matlab

GRAPHICS/3D MODELING

- Photoshop
- Google Sketchup
- 3DS Max

3D TECHNOLOGIES

- X3D
- Vizard
- Wired/wireless/markerless tracking systems
- Mocap
- CAVE/HMDs/3D displays
- Sport simulators

SPORT

- Coaching
- Human anatomy
- Biomechanics
- Physiological sensors

WORK EXPERIENCE (continued)

ASSISTANT VOLLEYBALL COACH / INSTRUCTOR

Appalachian State University, 2007 – 2010

As a coach for the university's women's volleyball program, my duties included player training, video analysis, travel arrangements, opponent scouting, game-day preparations, and equipment management. In addition, I also taught several volleyball and badminton classes every semester where I was responsible for instruction, grading, and course administration.

PROFESSIONAL VOLLEYBALL PLAYER

- Canadian National Team, 2003 – 2006
- Clube Desportivo Ribeirense, Azores, Portugal, 2015
- Palma-CIDE, Mallorca, Spain, 2006 – 2007
- Alvemaca Eccentric, Tenerife, Spain, 2005 – 2006
- Hainaut Volley, Valenciennes, France, 2004 – 2005
- USC-Braunschweig, Braunschweig, Germany, 2003 – 2004

SOFTWARE ENGINEER

AUEL-EDV, Braunschweig, Germany, 2004

While playing volleyball in Germany I also worked part-time as a software engineer on a medium-scale database application.

TEACHING EXPERIENCE

GRADUATE TEACHING ASSISTANT

Dept of Computer Science, Virginia Tech, Fall 2010

My duties included administering the lab portion of an introductory programming course, grading and office hours.

LAB INSTRUCTOR

Dept of Computer Science, University of Manitoba, Fall 2003

I was the lab instructor for a first-year programming class. My duties included teaching the lab and writing lesson plans.

UNDERGRADUATE TEACHING ASSISTANT

Department of Computer Science, Virginia Tech, 2001 – 2003

Over the course of my undergraduate studies I worked as a teaching assistant for a variety of courses in the department. I held office hours to help students with coding assignments.

RESEARCH PROJECTS

For my master's thesis, I investigated the feasibility and usefulness of using virtual reality (VR) for two sport subdomains: sport psychology and sport biomechanics. I wanted to determine if the training benefits that have been observed in other VR domains could also generalize to athletics. Below I provide a brief description of the two projects, along with some images of the software applications.

VIRTUAL REALITY FOR SPORT PSYCHOLOGY TRAINING

Based upon the success of Virtual Reality Exposure Therapy (VRET), where phobic patients are treated for their fears using virtual environments, I was curious to explore the potential of virtual reality as a training platform for high-anxiety sport situations. Using Virginia Tech's VisCube (a 4-walled immersive VR display), I developed an application for soccer goalkeepers to defend against penalty kicks. Multiple environments were created, with varying degrees of fidelity and anxiety triggers. The application was used for two studies, one with high-level goalkeepers and the other with regular population. Using physiological sensors and surveys we were able to determine that anxiety could be triggered in users, suggesting that VR has potential for sport psychology training.

VIRTUAL REALITY FOR BIOMECHANICAL TRAINING

This system was developed to explore the potential for VR to support sport biomechanical training. The system was aimed at adolescents aged 5-12 who were looking to improve their jumping ability. The system uses the Microsoft Kinect to provide real-time, full-body tracking to turn a common plyometric exercise (continuous lateral jumping) into a video game. The user's movements control a cartoon avatar, and they must jump back-and-forth between two rocks floating in a sea of lava. If they take too much time between jumps, or if they do not jump a far enough distance (based on their height), the avatar sinks into the lava, points are lost, and a new avatar appears. While the user is playing the game, the system analyzes the jumping biomechanics. When the round is over, users are shown images depicting their biomechanical performance and tips for improvement. The purpose of the biomechanical analysis is twofold: (1) to improve the user's jumping ability, and (2) to reduce the risk of injuries associated with poor jumping technique.

PUBLICATIONS

Stinson, C., Bowman, D. Feasibility of training athletes for high-pressure situations using virtual reality. IEEE Transactions on Visualization and Computer Graphics, 2014, pp. 606-615. DOI: https://doi.org/10.1109/TVCG.2014.23

Stinson, C. Master's Thesis: Virtual reality for sport training, 2013. Available at: https://vtechworks.lib.vt.edu/bitstream/handle/10919/23179/Stinson_CA_T_2013.pdf

Bacim, F., Ragan, E., **Stinson, C.**, Scerbo, S., Bowman, D. Collaborative navigation in virtual search and rescue. IEEE Symposium on 3D User Interfaces, 2012. DOI: https://doi.org/10.1109/3DUI.2012.6184224

Bowman, D., McMahan, R., **Stinson, C.**, Ragan, E., Scerbo, S., Hollerer, T., Lee, C., Kopper, R. Evaluating effectiveness in virtual environments with MR simulation. The interservice/Industry Training, Simulation & Education Conference, 2012. Available at: https://www.researchgate.net/publication/272352439_Evaluating_Effectiveness_in_Virtual_Environments_with_MR_Simulation

Bacim, F., **Stinson, C.**, Laha, B., Bowman, D. Building blocks: A novel metaphor for solving 3D puzzles. IEEE Symposium on 3D User Interfaces, 2011, pp. 127-128. DOI: http://doi.ieeecomputersociety.org/10.1109/3DUI.2011.5759238

Kopper, R., **Stinson, C.**, and Bowman, D. Towards an understanding of the effects of amplified head rotations. Workshop on Perceptual Illusions in Virtual Environments, 2011, pp. 10-15. Available at: https://www.researchgate.net/publication/266178657_Towards_an_Understanding_of_the_Effects_of_Amplified_Head_Rotations

He, J., Verstak, A., Watson, L., **Stinson, C.**, Ramakrishnan, N., Shaffer, C., Rappaport, T., Anderson, C., Bae, K., Jiang, J., Tranter, W. Globally optimal transmitter placement for indoor wireless communication systems. IEEE Transactions on Wireless Communications, 2004, pp. 1906-1911. DOI: https://doi.org/10.1109/TWC.2004.837454