Brandon Merkl

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OBJECTIVE:

Continue to develop my skills in the field of Biomedical Engineering by pursuing a Ph.D. at the University of Tennessee. Positioning myself as a top researcher in the field will require a dedication to the field that will carry me through a rigorous course load and endow me with research skills on par with the world's finest research institutions. To supplement my strong engineering background I will need to focus on problem-specific aspects of the field including, but not limited to: biomechanics, information processing, biology, and materials.

EDUCATION:

University of Tennessee   *January 2005 – Present*

- Pursuing an advanced degree in Biomedical Engineering
- Awarded a Graduate Research Assistantship
- Current GPA: 4.00 / 4.00
- Hold active position at UT's Center for Musculoskeletal Research researching and developing technologies to build a surgical navigation system. The surgical navigation system will rely on smart sensors and smart antennas, which are the main focus of my research, built on a backbone of ultra-wideband communications (UWB).
- Working in a collaborative group with UT's Anthropology department developing statistical bone models for forensic and pre-historic inferences.

Colorado School of Mines   *August 2000 – December 2004*

- Bachelor of Science in Engineering, Electrical Specialty
- Bachelor of Science in Computer Science
- Overall GPA: 3.59 / 4.00
- High scholastic honors in both degrees

TECHNICAL EXPERIENCE:

Center for Musculoskeletal Research (CMR)   *January 2003 – Present*

- Developed and extended proprietary biomedical software used for the analysis of patients undergoing joint replacement. The software has been expanded to complete analysis on patients with normal joints.

- Specifically added new support to the software to allow users to select differing types of optimization algorithms, including simulated annealing and quasi-Newton. Integrating these new optimization algorithms as well as other changes with existing software to maximize the productivity of the end users and also helping improve the robustness of the code.
- Actively maintained and updated an SQL database which includes large amounts of patient data including, measurements, images, CAD models, and personal information. Additionally, updated existing database Graphical User Interface (GUI) to provide more functionality and enhance usability from a user interaction (UI) perspective. This has greatly added to a positive workflow, setting an example for other in-house software applications.
- Augmented my studies in computer science by actively learning several powerful technologies important to programming in a Windows environment including: Microsoft Visual Studio .NET, Trolltech's QT, TGS Open Inventor, and Microsoft's SQL Sever 2000.
- Gathered experience in many related fields such as biomechanics, image processing, computer vision, medical image acquisition, and anatomy and physiology.

Internship at Oak Ridge National Laboratory   *January 2004 – August 2004*

- Participated in internship program sponsored by both the Department of Energy's (DOE) and University of Tennessee entitled the Science Undergraduate Laboratory Internships (SULI) program.
- Worked on a number of research projects involving statistical representations of bones, 3D segmentation, and biplane fluoroscopic registration.
- Learned several optimization algorithms such as the genetic algorithm and simulated annealing while successfully applying them to solve problems of 3D/3D registration.
- Developed a novel non-linear 3D model warping method that has proved a critical step in creating atlases of higher-curvature bones such as lumbar vertebrae and pelves.
  Found critical contacts at ORNL that have helped in current research of micro-fabrication techniques as applied to smart sensors and smart antennas.

Straightedge Fire Alarm   *February 2003 – June 2004*

- Lighting and Electrical power in architectural design – designed to meet client requirements and under compliance of 2003 National Electric Code (NEC).
- ADA compliant fire alarm design for small businesses – provide solutions for both light-industry and medium size commercial spaces
- Miscellaneous architectural drafting and design

Physics Internship   *January 2002 – August 2002*

- Researched quantum dots, nanostructures, thin films, self-assembled monolayers and their applicability to the field of quantum computing.
- Trained on Atomic Force Microscope (AFM). Also familiar with principles and design of Scanning Tunneling Microscopy (STM) and Transmission Electron Microscopy (TEM).
- Purchased equipment and supplies to convert a low temperature annealing furnace to high temperature (1300° C) furnace to grow high-quality oxide layers on 111 silicon.
- Prepared TEM samples by mechanical polishing and reactive ion milling.

AWARDS/HONORS:

- Outstanding Paper Award for "Unsupervised Three-Dimensional Segmentation of Medical Images Using an Anatomical Bone Atlas." 12th International Conference on Biomedical Engineering, 2005.
- University of Tennessee College of Engineering Ph.D. Graduate Fellowship, 2005-Present.
- Graduate Research Assistantship to pursue a Ph.D. degree in Biomedical Engineering from the University of Tennessee, 2005-Present.
- Dean's List 5 out of 9 semesters at the Colorado School of Mines.
- Qualified for the Presidential Scholarship at the Colorado School of Mines that covers tuition in full.
- Eagle Scout