

EMILY PRITCHARD

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EDUCATION

BACHELOR OF SCIENCE, BIOMEDICAL ENGINEERING, HONORS DESIGNATION

University of Tennessee, Knoxville, TN, May 2006

- Biomedical Engineering major *summa cum laude* GPA: 3.86/4.0
- University Honors Program

RESEARCH EXPERIENCE

Center for Musculoskeletal Research 2003-present

University of Tennessee/Oak Ridge National Laboratory

- Designed, fabricated, and tested novel pressure sensors for biomedical applications
- Analyzed patient-specific kinematics of *in vivo* joint implants and normal joints using 2D to 3D registration and fluoroscopy
- Assisted in the development of bone database for pre-operative surgical planning
- Wrote technical proposals for research grants and equipment purchasing including UT College of Engineering, NSF, NIH-NBIB, IEEE (\$500,000+ awarded)

Senior Design: Biocompatible MEMS Pressure Sensing Array for Total Knee Arthroplasty

- Fabrication process optimization and material selection for biocompatibility
 - Experimental cleanroom experience
- Simulation of sensor array for array design optimization (Maxwell, Coventor)

UT/ORNL Chancellor's Summer Undergraduate Research Internship 2004-2005

- Modeling of the Degenerative Lumbar Spine, Zimmer Dynesys Study (2004)
- Correlated Instrumented Tibial Tray Forces with 3D Fluoroscopic Analysis, Scripps Clinic (2005)

U.S. Department of Energy "Student Undergraduate Laboratory Internship" 2004

Oak Ridge National Laboratory

Computational Sciences and Engineering Division, Modeling and Simulation Group

- 3D modeling and database construction for the lumbar spine, hip, and knee

PUBLICATIONS

- M.J. Kuhn, M.R. Mahfouz, E. Ali Abd ElFatah, B.C. Merkl, **E. Pritchard**. "3D Bone Reconstruction from Biplanar X-Rays." in *Intl. Conf. on Biomed. Engr. Proceedings*, Singapore, 2005.
- G. To, M. Mahfouz, and **E. Pritchard**. "Ligament Balancing during Total Knee Arthroplasty with Wireless Encapsulated Microcantilever Strain Sensors." in *Intl. Conf. on Biomed. Engr. Proceedings*, Singapore, 2005.
- B. Evans, M. Mahfouz, **E. Pritchard**, and G. To. "Development of Embedded MEMS Strain Sensor Arrays for Biomedical Applications." in *Intl. Conf. on Biomed. Engr. Proceedings*, Singapore, 2005.
- Mohamed R. Mahfouz, Robert E. Booth, Jr., Jean Noel Argenson, Brandon C. Merkl, Michael J. Kuhn, Emam E. Abdel Fatah, **Emily R. Pritchard**. "Utilization of Biplanar X-Ray Images in 3D Reconstruction of Patient-Specific Bones and Automatic Morphometric Measurements," 7th International Symposium on Computer Methods in Biomechanics and Biomedical Engineering, Antibes, Cote d'Azur, France, 2006.
- Mohamed Mahfouz, Ahmed Badawi, Brandon Merkl, Emam E. Abdel Fatah, **Emily Pritchard**, Kat Kesler, Megan Moore, and Richard Jantz, "3D Statistical Shape Models of Patella for Gender Classification," The 28th Annual International Conference of the IEEE Engineering in Medicine and Biology Society, New York, New York, USA, 2006.

HONORS

- **Goldwater Scholar 2005** for outstanding undergraduate research
- **National Merit Scholar (finalist) 2002**
- **Top Engineering Award**, Exhibition of Undergraduate Research and Creative Achievement

UNDERGRADUATE SCHOLARSHIPS

- Goldwater Scholarship for Undergraduate Research
- National Merit Scholarship (finalist)
- Presidential Scholarship (UT)
- Thomas Dunlap Scholarship (UT)
- Tennessee Scholars Scholarship (UT)
- Elmo and Ernest-Lou Rowland Scholarship (UT Alumni)
- Herbert and Lillian Duggan Engineering Scholarship (UT Engineering Dept.)
- Colonel Samuel H. Lockett Engineering Scholarship (UT Engineering Dept.)
- L. Raymond Shobe Engineering Scholarship (UT Engineering Dept.)

ORGANIZATIONS and ACTIVITIES

Biomedical Engineering Society, UT Chapter

- President-elect, December 2004 - May 2006
 - Initiated Thanksgiving Food Drive to benefit Second Harvest Food Bank
 - Increased membership 500%+
 - Organized society meetings, speakers, and events, such as Engineer's Day high school outreach participation
 - Vice President, 2003 – 2004
 - Treasurer, 2002–2003

Tau Beta Pi, National Engineering Honors Society, Alpha Chapter member

Society of Women Engineers, UT chapter member

English as a Second Language (ESL) for Spanish-Speakers Volunteer:

- ESL Intermediate class for adults: primary English teacher for beginner level class
- ESL work with elementary-age children in local schools: reading tutor

ADDITIONAL INFORMATION

- Natural leadership skills developed further through team leadership and task delegation
- Interfaces well within a team or alone as part of a larger project
Great communication skills to interface with non-engineers and biomedical industry (experience in orthopedics)
- Cleanroom training at Cornell NanoScale Facility, Ithaca, NY and Oak Ridge National Laboratory, Oak Ridge, TN
- Knowledge of photolithography, reactive ion etching, thermal and evaporation deposition, parylene deposition, molecular vapor deposition, atomic force microscopy, L-Edit design layout
- Proficient in Matlab programming, 3D modeling (Rapidform, Nugraf, Mayo Clinic Analyze, and Amira), basic web design