

# Curriculum Vitae

MARK S. FOSKEY

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## Degrees

- M.S. in Computer Science, May 2001. University of North Carolina, Chapel Hill.
- Ph.D. in Mathematics, 1994. University of California, San Diego. Dissertation in algebraic topology, "Higher Projective Planes and the Cohomology of  $n$ -Fold Loop Spaces."
- M.A. in Mathematics, June 1991. University of California, San Diego.
- A.B. in Mathematics, June 1988. Princeton University.

## Experience

University of North Carolina, Chapel Hill

- 2004–Present: **Research Assistant Professor**, Department of Radiation Oncology
- 2003–Present: **Adjunct Research Assistant Professor**, Department of Computer Science
- 2002–2004: **Research Assistant Professor**, Department of Radiology
- 2001–2002: **Postdoctoral Research Associate**, Department of Computer Science
- 1998–2001: **Research Assistant**, Department of Computer Science

Jacksonville University, Jacksonville, FL.

- 1994–1998: **Assistant Professor**, Department of Mathematics.

**Publications****Papers in Refereed Journals**

- Avneesh Sud, Mark Foskey, and Dinesh Manocha. Homotopy-preserving medial axis simplification. *International Journal of Computational Geometry and Applications*, 17 (5): 423–451, 2007.
- Mark Foskey, Bradley C. Davis, Lav Goyal, Sha Chang, Edward L. Chaney, Nathalie Strehl, Sandrine Tomei, Julian Rosenman, and Sarang Joshi. Large deformation 3D image registration in image-guided radiation therapy. *Physics in Medicine and Biology*, 50:5869–5892, 2005.
- John Keyser, Tim Culver, Mark Foskey, Shankar Krishnan, and Dinesh Manocha. ESOLID—a system for exact boundary evaluation. *Computer-Aided Design*, 36(2):175–193, 2004. Special issue on ACM Solid Modeling.
- Mark Foskey, Ming C. Lin, and Dinesh Manocha. Efficient computation of a simplified medial axis. *Journal of Computing and Information Science in Engineering*, 3:274–284, 2003. Special issue on solid modeling theory and engineering applications.
- Mark Foskey. Split dual Dyer-Lashof operations. *Journal of Pure and Applied Algebra*, 128 (1998) 233–249.
- Mark Foskey and Michael Slack. On the odd primary cohomology of higher projective planes. *Pacific Journal of Mathematics*, 173 (1996), 77–92.

**Papers at Refereed Conferences**

- Huai-Ping Lee, Ming C. Lin, and Mark Foskey. Physically-based validation of deformable medical image registration. In *Medical Image Computing and Computer Assisted Intervention, Lecture Notes in Computer Science 5242*, pages 830–838, 2008.
- Suman K. Sen, Mark Foskey, James S. Marron, and Martin A. Styner. Support vector machine for data on manifolds: An application to image analysis In *Proceedings of the IEEE International Symposium on Biomedical Imaging: From Nano to Macro (ISBI)*, pages 1195–1198, 2008.
- Joshua H. Levy, Mark Foskey, and Stephen M. Pizer. Rotational flows for interpolation between sampled surfaces. In *Computer Vision and Pattern Recognition Workshops (CVPR)*, pages 1-8, 2008.

- Bradley C. Davis, Mark Foskey, Julian Rosenman, Lav Goyal, Sha Chang, and Sarang Joshi. Automatic segmentation of intra-treatment CT images for adaptive radiation therapy of the prostate. In *Medical Image Computing and Computer Assisted Intervention, Lecture Notes in Computer Science 3749*, pages 442–450, 2005.
- Avneesh Sud, Mark Foskey, and Dinesh Manocha. Homotopy-preserving medial axis simplification. In *Proceedings of ACM Symposium on Solid and Physical Modeling*, pages 39–50, 2005.
- Mark Foskey, Ming C. Lin, and Dinesh Manocha. Efficient computation of a simplified medial axis. In *Proceedings of the ACM Symposium on Solid Modeling*, pages 96–107, 2003.
- Derek Cool, Dini Chillet, Jisung Kim, Mark Foskey, and Stephen Aylward. Tissue-based affine registration of brain images to form a vascular density atlas. In *Proceedings of the Conference on Medical Image Computing and Computer-Assisted Intervention, Part II*, pages 8–15, 2003.
- Jean-Philippe Guyon, Mark Foskey, Jisung Kim, Zeynap Firat, Bradley C. Davis and Stephen Aylward. VETOT, volume estimation and tracking over time: Framework and validation. *Proceedings of the Conference on Medical Image Computing and Computer-Assisted Intervention, Part II*, pages 142–149, 2003.
- Mark Foskey, Ming C. Lin, and Dinesh Manocha. Efficient computation of a simplified medial axis. *Proceedings of the ACM Symposium on Solid Modeling*, pages 96–107, 2003.
- Ming C. Lin, William Baxter, Mark Foskey, Miguel Otaduy, and Vince Scheib. Haptic interaction for creative processes with simulated media. *Proceedings of the IEEE Conference on Robotics and Automation*, 2002.
- John Keyser, Tim Culver, Mark Foskey, Shankar Krishnan, and Dinesh Manocha. ESOLID—a system for exact boundary evaluation. *Proceedings of the ACM Symposium on Solid Modeling*, pages 23–34, 2002.
- Mark Foskey, Dinesh Manocha, Tim Culver, John Keyser, and Shankar Krishnan. Reliable geometric computations with algebraic primitives and predicates. *Proceedings of the Workshop on Uncertainty in Geometric Computations, Sheffield*, 2002.
- Mark Foskey, Miguel Otaduy, and Ming C. Lin. ArtNova: Touch-enabled 3D model design. *Proceedings of the IEEE Virtual Reality Conference*, pages 119–126, 2002.

Mark Foskey, Max Garber, Ming C. Lin, and Dinesh Manocha. A Voronoi-based hybrid planner. *Proceedings of the IEEE/RSJ International Conference on Intelligent Robots and Systems*, 2001.

### Conference presentations

Mark Foskey, Graham Gash, Qiong Han, Gregg Tracton, Sarang Joshi, Stephen M. Pizer, Edward L. Chaney. A software toolkit for multi-image registration and segmentation in IGRT and ART. Poster presentation, American Association of Physicists in Medicine, 2007.

Mark Foskey, Julian Rosenman, Elaine Zeman, Jun Lian, Daniel Fried, Sarang Joshi. How much does patient repositioning using on-treatment-table CT imaging improve prostate cancer treatment outcome? Poster presentation, American Society for Therapeutic Radiology and Oncology, 2006.

Daniel Fried, Julian Rosenman, Mark Foskey, D. Stevenson, Arnold Bragg, David Morris, Mitchell Anscher. Simulating a randomized trial using stratification and re-sampling of retrospective data. Poster presentation, American Society for Therapeutic Radiology and Oncology, 2006.

Eric C. Schreiber, Zijie Xu, Amy Lorenzen, Mark Foskey, Tim Cullip, Gregg Tracton, Edward L. Chaney. PPlanUNC as an open-source radiotherapy planning system for research and education. Poster presentation, American Association of Physicists in Medicine, 2006.

Mark Foskey, Bradley C. Davis, Lav Goyal, Sha Chang, Julian Rosenman, and Sarang Joshi. Automatic contouring via deformable image registration. Poster presentation, American Society for Therapeutic Radiology and Oncology, October 2005.

Julian Rosenman, Mark Foskey, Lav Goyal, Sha Chang, Sarang Joshi. The calculation of radiation dose actually delivered to the patient. Poster presentation, American Society for Therapeutic Radiology and Oncology, October 2005.

Mark Foskey, Julian Rosenman, Lav Goyal, Sha Chang, and Sarang Joshi. Calculating biological effective dose in the presence of organ deformation. Poster presentation, American Association of Physicists in Medicine, July 2005.

**Software packages**

PluncSnap, a package integrating the existing ITK-SNAP segmentation tool with the treatment planning system PlanUNC. Released April 30, 2007 at <http://planunc.radonc.unc.edu/software/planunc6610/>.

**Memberships**

American Society for Therapeutic Radiology and Oncology

American Association of Physicists in Medicine

IEEE Computer Society

American Association for the Advancement of Science

**Professional activities**

Served on doctoral committees for: Kelly Ward, Theodore Kim, Avneesh Sud, Josh Levy, Joshua Stough, Russell Gayle, Liangjun Zhang, Suman Sen.

Referee for: Physics in Medicine and Biology, Eurographics conference, IEEE Transactions on Biomedical Engineering, IEEE Transactions on Image Processing, IEEE Transactions on Medical Imaging, IEEE Transactions on Information Technology in Biomedicine, Computer Aided Design.