

Curriculum Vitae of Leandra Vicci

Current Appointment: 1981 – Lecturer of Computer Science and Director of the Applied Engineering Laboratory (previously, *Microelectronic Systems Laboratory*), Department of Computer Science, University of North Carolina, Chapel Hill, NC.

Previous Appointments:

- ★ 1978 – Engineer, Electro Scientific Industries, Portland, OR;
- ★ 1975 – Supervisor, University of Oregon, Eugene, OR;
- ★ 1972 – Engineer, Oregon Graduate Center, Beaverton, OR;
- ★ 1965 – Engineer, Boeing Aerospace, Seattle, WA;
- ★ 1962 – Lab Technician, Scripps Institute of Oceanography, La Jolla, CA;
- ★ 1961 – Coop Intern, Woods Hole Oceanographic Institution, Woods Hole, MA;
- ★ 1960 – Coop Bench Technician, ACF Industries, Paramus, NJ;
- ★ 1960 – Coop Research Assistant, Florida State University, Tallahassee, FL.

Education:

- ★ Antioch College, Physics, B.S., 1964.

Awards:

- ★ 1996 UNC Chapel Hill Chancellor's Award for Innovation in Research.
- ★ 1996 North Carolina Governor's Award for Innovation.

Recent Publications:

BOOK CHAPTERS

- ★ Taylor II, R. M., D. Borland, F. P. Brooks Jr., M. Falvo, M. Guthold, T. Hudson, K. Jeffay, G. Jones, D. Marshburn, S. J. Papadakis, L.-C. Qin, A. Seeger, F. D. Smith, D. H. Sonnenwald, R. Superfine, S. Washburn, C. Weigle, M. C. Whitton, P. Williams, L. Vicci and W. Robinett, "Visualization and Natural Control Systems for Microscopy," in *Visualization Handbook*, edited by C. Johnson and C. Hansen, Harcourt Academic Press, 2004, pp.875-900.

REFEREED JOURNALS

- ★ Spero, R. C., L. Vicci, J. Cribb, D. Bober, V. Swaminathan, E. T. O'Brien, S. Rogers, R. Superfine, "High Throughput system for magnetic manipulation of cells, polymers, and biomaterials," *Review of Scientific Instruments*, **79**, 083707 (2008) (7 pages), August 2008.
- ★ Desai, K. V., G. Bishop, L. Vicci, E. T. OBrien, R. M. Taylor II, R. Superfine, "Agnostic particle tracking for three-dimensional motion of cellular granules and membrane-tethered bead dynamics," *Biophysical Journal*, vol. 94 no. 6, pp. 2374-84, 15 March 2008.
- ★ E. L. Bouzarth, A. Brooks, R. Camassa, J. Hao, T. J. Leiterman, R. M. McLaughlin, R. Superfine, J. Toledo, L. Vicci, "Epicyclic orbits in a viscous fluid about a precessing rod: Theory and experiments at the micro- and macro-scales," *Physical Review E*, vol. 76 no. 1, July 2007.

- ★ Spero, R. C., B. Smith, L. Vicci, J. Cribb, E. T. O'Brien, S. T. Lord, R. Superfine, "High throughput microbead rheology of fibrin gels," *Biophysical Journal*, vol. 92 no. 1, Suppl. S, Jan 2007.
- ★ Cribb, J., D. B. Hill, R. M. Taylor II, L. Vicci, J. Fisher, K. V. Desai, M. G. Forest, R. Superfine, "Nonlinear rheology of entangled lambda-DNA solutions via driven microbead rheology" *Biophysical Journal*, vol. 92 no. 1, Suppl. S, Jan 2007.
- ★ Fisher, J. K., L. Vicci, J. Cribb, E. T. O'Brien, R. M. Taylor, R. Superfine, "Magnetic force micromanipulation systems for the biological sciences," *NANO*, vol. 1, no. 3, pp. 191-205, November 2006.
- ★ Hall, A. R., An, L., Liu, J., Vicci, L., Falvo, M. R., Superfine, R., Washburn, S., "Experimental measurement of single-wall carbon nanotube torsional properties," *Physical Review Letters*, vol. 96, no. 25, pp. 256102/1-4, 30 June 2006.
- ★ Fisher, J., J. Cribb, K. Desai, L. Vicci, B. Wilde, K. Keller, R. Taylor II, J. Haase, K. Bloom, T. O'Brien, R. Superfine, "Thin-foil magnetic force system for high-numerical-aperture microscopy," *Review of Scientific Instruments*, (pub. on-line) 14 February 2006.
- ★ Desai, K. V., G. Bishop, L. Vicci, E. T. O'Brien, R. M. Taylor II, R. Superfine, "Agnostic Tracking: A New Era for Laser Interferometry in Biology," *Biophysical Journal*, vol. 90 no. 1, Jan 2006.
- ★ Fisher, J., L. Vicci, J. Cummings, K. Keller, B. Wilde, T. O'Brien, K. Desai, C. Weigle, G. Bishop, R. Taylor II, C. Davis, R. Boucher, R. Superfine, "Three-dimensional force microscope: A nanometric optical tracking and magnetic manipulation system for the biomedical sciences," *Review of Scientific Instruments*, vol. 76 no. 5, May 2005.
- ★ Meehan, T.D., Vicci, L., O'Brien, E.T., Fisher, J., Superfine, R., "Quantitative study of the magnetophoresis of ferritin labeled beads," *Biophysical Journal*, vol. 88 no. 1, Jan 2005.
- ★ Cribb, J., Hill, D.B., Taylor, R.M., Vicci, L., Fisher, J., Desai, K.V., Wilde, B., Sheehan, J., Forest, M.G., Superfine, R., "Measuring local microrheological properties of human mucus with magnetically driven microbeads," *Biophysical Journal*, vol. 88 no. 1, Jan 2005.
- ★ Dwyer, C., L. Vicci, J. Poulton, D. Erie, R. Superfine, S. Washburn, R. M. Taylor II, "The design of DNA self-assembled computing circuitry," *IEEE Tran. VLSI Systems*, vol. 12, pp. 1214-20, November 2004.
- ★ Papadakis, S. J., A. R. Hall, P. A. Williams, L. Vicci, M. R. Falvo, R. Superfine, S. Washburn, "Resonant Oscillators with Carbon-Nanotube Torsion Springs," *Physical Review Letters*, vol. 93, p. 146101, 1 October 2004.
- ★ Dwyer, C., J. Poulton, R. Taylor, L. Vicci, "DNA self-assembled parallel computer architectures," *Nanotechnology*, vol. 15, pp. 1688-94, October 2004.
- ★ Dwyer, C., L. Vicci, and R. M. Taylor, "Performance simulation of nanoscale silicon rod field-effect transistor logic," *IEEE Trans. Nanotechnology*, vol. 2, pp. 69 V74, June 2003.

CONFERENCES

- ★ Desai, K. V., G. Bishop, L. Vicci, E. T. O'Brien, R. M. Taylor II, R. Superfine, "Agnostic Tracking: in situ and on-the-fly calibration for 3D position tracking," *Biomedical Engineering Society meeting*, 2006.
- ★ Hao, J., B. Wilde, R. M. Taylor II, L. Vicci, R. M. McLaughlin, R. Camassa, T. J. Leiterman, R. Superfine, "Nanoscale Fluidics: Modeling Cilia with a Rotating Magnetic Nanowire," *Materials Research Soc. Annual Fall Mtg*, 2005.
- ★ Carroll, R. L., B. Wilde, R. M. Taylor, L. Vicci, S. Washburn, and R. Superfine, "Biomimetic Flexible Polymer Rods—Artificial Cilia," *American Physical Soc. Southern Section Annual Mtg.*, 2003.
- ★ Desai, K. V., G. Welch, G. Bishop, L. Vicci, R. M. Taylor, R. Superfine, "3D Tracking of a Particle in 3DFM," *American Physical Soc. Southern Section Annual Mtg.*, 2003.
- ★ Hao, J., B. Wilde, J. Cribb, C. Dwyer, J. Fisher, K. Desai, L. Vicci, R. M. Taylor II, R. Superfine, "Nanoscale Fluidics: Using Magnetic Nanorods as Model Cilia," *American Physical Soc. Southern Section Annual Mtg.*, 2003.
- ★ Superfine, R., L. Vicci, J. Hao, J. Fisher, B. Wilde, R. M. Taylor, E. T. O'Brien, "Magnetic pole structures for biological force measurements," *2003 Biomedical Engineering Society Meeting*, October 2003.
- ★ Fisher, J., R. Superfine, T. O'Brien, R. M. Taylor II, C. W. Davis, H. Matsui, L. Vicci, G. Matthews and B. Wilde "Motion and force generation of cilia in human lung cell cultures," *47th Biophysical Society Annual Meeting*, San Antonio, TX, March 1-5, 2003.
- ★ Sill, D., J. Hao, D. Brandl, B. Wilde, J. Fisher, L. Vicci, R. M. Taylor II, R. Superfine, "Microfabricated magnetic pole structures for biological force measurements," *47th Biophysical Society Annual Meeting*, San Antonio, Texas., March 1-5, 2003.

TECHNICAL REPORTS

- ★ Vicci, Leandra "The 3DFM Magnet Drive Amplifier," TR05-002, Department of Computer Science, UNC at Chapel Hill, January 2005.
- ★ Vicci, Leandra "Analytical bead force model for the 3DFM," TR03-029, Department of Computer Science, UNC at Chapel Hill, September 2003.
- ★ Vicci, Leandra "B&K 4370 Accelerometer and Charge Amplifier Manual," TR03-002, Department of Computer Science, UNC at Chapel Hill, January 2003.

Intellectual Property

PATENTS

- ★ Vicci, Leandra and R. Superfine, "Methods and systems for three-dimensional motion control and tracking of a mechanically unattached magnetic probe," U.S. Pat. No. 7,305,319; 4 December 2007.
- ★ Vicci, Leandra and R. Superfine, "Methods and systems for controlling motion of and tracking a mechanically unattached probe," U.S. Pat. No. 7,191,092; 13 March 2007.
- ★ Vicci, Leandra and R. Superfine, "Methods and systems for controlling motion of and tracking a mechanically unattached probe," U.S. Pat. No. 7,189,969; 13 March 2007.

- ★ Vicci, Leandra and R. Superfine, “Methods and systems for controlling motion of and tracking a mechanically unattached probe,” U.S. Pat. No. 7,119,645; 10 October 2006.
- ★ Vicci, Leandra, “Methods and systems for reactively compensating magnetic current loops,” U.S. Pat. No. 6,960,984; 1 November 2005.
- ★ Vicci, Leandra, “Magnetic-flux conduits,” U.S. Pat. No. 6,720,855; 13 April 2004.

Professional activities and service:

- ★ Member of IEEE, ACM
- ★ Conference committee, ARVLSI95
- ★ Nine MCNC technical advisory committees, 1982-1991
- ★ UNC Patent Committee 1988-1998
- ★ UNC College of Arts and Sciences Conflict of Interest Oversight Committee 1996-2006