Matthew M. McCormick

CONTACT INFORMATION

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OBJECTIVE

Medical image analysis research with open source software. Diagnostic ultrasound preferred, but also interested in other imaging modalities.

EDUCATION

University of Wisconsin-Madison

Ph.D. Biomedical Engineering, May 2011

- Dissertation Topic: "Carotid Plaque Characterization with Medical Ultrasound"
- GPA: 3.70/4.0

M.S. in Biomedical Engineering, May 2008

Marquette University, Milwaukee, Wisconsin USA

B.S., Biomedical Engineering, May, 2005

- Minor: Mathematics, Biology
- Marquette University Honors Program
- GPA: 3.88/4.0

St. Mary's University of Minnesota, Winona, Minnesota USA

1999-2001

Minnesota Academy of Mathematics and Science, Winona, Minnesota USA

Graduated May, 2001

Cotter High School, Winona, Minnesota USA

Graduated May, 2001

WORK EXPERIENCE

University of Wisconsin-Madison, USA

Research Assistant **June 2005 - Present**
Research diagnostic medical ultrasound stiffness imaging methods for non-invasive assessment of the carotid artery.

Teaching Assistant **January 2009 - May 2009**
Prepared, taught, and graded laboratories for the Diagnostic Ultrasound Physics course.

Neuromotor Control Laboratory Marquette University, Milwaukee, WI USA

Research Assistant **May 2004 - May 2005**
Electronic/mechanical hardware development for MRI compatible wrist robot, data processing and analysis for understanding of nervous system use of sensory information, adaptation, and control of the skeletal muscle system.

Boston Scientific Corporation Maple Grove, MN USA

Research and Design Intern **June 2003 - August 2003**
Research and development on peripheral vascular self-expanding Nitinol stents.

Educational Opportunity Program Marquette University, Milwaukee, WI USA

Tutor **August 2002 - May 2005**
Tutor college students in courses such as biology, chemistry, and calculus.

Minnesota Association for Human Genetics University of Minnesota, Minneapolis, MN USA
Research Intern **May 2000 - June 2000**
Perform genetic sequence analysis on the tyrosinase gene of individuals with albinism to probe for mutations.

Publications and Manuscripts

McCormick, M and Varghese, T. An Approach to Unbiased Subsample Interpolation For Motion Tracking. Ultrasonics. In Review. 2011.

McCormick, M, Madsen, E; Deaner, M; Varghese, T. Absolute Backscatter Measurement of Tissue-Mimicking Phantoms in the 5-45 MHz Frequency Range. Journal of the Acoustical Society of America. In Review. 2011.

McCormick, M, Rubert, N and Varghese, T. Bayesian Regularization Applied to Ultrasound Strain Imaging. IEEE Transactions on Biomedical Engineering. In Press. 2011.

Perrot-Audet, A, McCormick, M, Gelas, A, Rannou, N, Souhait, L, Mosaliganti, K, and Megason, S. A Lightweight Image Comparison Library. Kitware's The Source. Issue 16, January 2011. URL:
`http://www.kitware.com/products/html/ALightweightImageComparisonLibrary.html`

̣McCormick, M. Ultrasound and ITKv4. Kitware's The Source. Issue 16, January 2011. URL:
`http://www.kitware.com/products/html/UltrasoundAndITKv4.html`

̣Madsen, E; Frank, G; McCormick, M; Deaner, M. Anechoic Sphere Phantoms for Estimating 3-D Resolution of Very High Frequency Ultrasound Scanners. IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control. 57 (10):2284-2292. 2010.

McCormick, M. Higher Order Accurate Derivative and Gradient Calculation in ITK. Insight Journal. 2010 July-December. URL:
`http://hdl.handle.net/10380/3231`

̣McCormick, M. Visual Debugging of ITK. Kitware's The Source. Issue 13, April 2010.

McCormick, M. An Open Source, Fast Ultrasound B-Mode Implementation for Commodity Hardware. Insight Journal. 2010 January-June. URL:
`http://hdl.handle.net/10380/3159`

̣Shi, H; Varghese, T; Mitchell, C; McCormick, M; Dempsey, RJ; Kliewer, MA. In-vivo Attenuation and Equivalent Scatter size parameters for Atherosclerotic Carotid Plaque: Preliminary Results. Ultrasonics 49 (8):779-785. 2009.

Shi, H; Mitchell, CC; McCormick, M; Kliewer, MA; Dempsey, RJ; Varghese, T. Preliminary in vivo atherosclerotic carotid plaque characterization using the accumulated axial strain and relative lateral shift strain indices. Phys Med Biol. 53 (22):6377-94. 2008. PMID: 18941278

Conference Presentations

McCormick, M and Varghese, T. Reduction of Reverberation Artifacts in Carotid Strain Images Using Bayesian Regularization. International Conference on the Ultrasonic Measurement and Imaging of Tissue Elasticity. Oct 16, 2010. Snowbird, Utah.

McCormick, M and Varghese, T. Subsample Displacement Interpolation Using Windowed-Sinc Reconstruction with Numerical Optimization. International Conference on the Ultrasonic Measurement and Imaging of Tissue Elasticity. Oct 16, 2010. Snowbird, Utah.

McCormick, M and Varghese, T. Open Technologies Applied to a Non-standard Medical Image Format for Innovative Research. MathBio2: IMAGE. November 2009. Madison, WI.

McCormick, M; Varghese, T; Dempsey, RJ; Zagzebski, J; Madsen, E. High Frequency Ultrasonic Characterization of Excised Atherosclerotic Carotid Plaque. Ultrasonic Imaging and Tissue Characterization Symposium. June 2009. Arlington, VA.

Madsen, E; McCormick, M; Frank, G. Phantoms for Assessing Intravascular (IVUS) Ultrasound Scanners. American Institutes in Ultrasound and Medicine Conference. April 2009. New York, NY.

McCormick, M; Shi, H; Mitchell C; Kliewer M; Dempsey R; Varghese T. Mechanical Viscoelastic Variations of *in vivo* Carotid Atheromas using External Ultrasound. Fifth International Conference on the Ultrasonic Measurement and Imaging of Tissue Elasticity. Oct 8, 2006. Snowbird, Utah USA.

Computer Skills

- Languages: C++, Python, Matlab, and Bash.
- Operating Systems: Linux, Windows.

Patches submitted to and accepted at:

- Awesome Window Manager
  `http://awesome.naquadah.org/`
- Bioimage Suite. Medical image processing and visualization.
  `http://www.bioimagesuite.org/`
- cgit. A fast web-interface for git repositories.
  `http://hjemli.net/git/cgit/about/`
- CMake. C and C++ configuration tool.
  `http://www.cmake.org/`
- gccxml. XML output for GCC.
  `http://www.gccxml.org/`
- Gentoo. Linux distribution.
  `http://www.gentoo.org/`
- InsightToolkit. Insight Segmentation and Registration Toolkit. *Developer status.*
  `http://itk.org/`
- Pyclewn. Pyclewn allows using vim as a front end to a debugger.
  `http://pyclewn.sourceforge.net/`
- QGoImageCompare. QGoImageCompare is a library aimed at simple comparison of images.
  `https://github.com/gofigure2/QGoImageCompare/`
- usimagtool. Medical ultrasound image processing tool.
  `http://www.lpi.tel.uva.es/usimag/en/ContenidoEn.php?IdContenido=6/`
- veusz. Veusz is a scientific plotting and graphing package written in Python.
  `http://home.gna.org/veusz/`
- vistrails. VisTrails is an open-source scientific workflow and provenance management system that provides support for data exploration and visualization.
  `http://vistrails.org/`

Awards and Activities

InSCIght. The Scientific Computing Podcast.

- Moderator/Panelist.
- `http://inscight.org/`

IEEE Student Member.

UW-Madison The Hacker Within. A peer-teaching group whose purpose is to provide non-computer scientists with the practical skills required to perform research.

- Organizing member of the 2011 Software Carpentry Bootcamp.
- Arranged university-sponsored guest lecture of Dr. John D. Hunter from Chicago.
- Organizing member of the 2010 Python Bootcamp.
- Presentations on CMake and creating custom pretty-printers in GDB.
- Representation at PyCon 2010.

2009 Department of Medical Physics Outstanding Teacher Award.

- Nomination by students.

Clinical Neuroengineering Training Program, University of Wisconsin-Madison, 2008-2009.

Marquette University Honors Program.

Alpha Eta Mu Beta, National Biomedical Engineering Honor Society.

- Local Chapter Secretary, 2003 - 2004
- President, 2004 - 2005

Pi Mu Epsilon- National Mathematics Honor Society.

Marquette University Concert, Jazz, Doc C's Combo, Orchestral, and Pep Bands.

Biomedical Engineering Society, BMES.

Marquette 2002 Engineering Outstanding Sophomore.

- Graduated with High Scholastic Honors

Rehabilitation Engineering Research Centers on Accessible Medical Instrumentation.

- First Place in category, Second Place overall for project on Accessible Syringe Dosing 2004-2005
- `http://www.eng.mu.edu/wintersj/b18/`