CURRICULUM VITAE

BRYN A. MARTIN
POSTDOCTORAL FELLOW, SWISS FEDERAL INSTITUTE OF TECHNOLOGY
SCHOOL OF ENGINEERING INTEGRATIVE BIOSCIENCE INSTITUTE
LABORATORY OF HEMODYNAMICS AND CARDIOVASCULAR TECHNOLOGY

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Place de la Palud 13
1003 Lausanne, Switzerland
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PERSONAL DATA
Birth date: January 31, 1980
Birthplace: Illiniois, U.S.A.
Spouse: Rachel Martin
Children: Noemi Martin

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EDUCATION

2008 Ph.D., Mechanical Engineering (biofluid mechanics), The University of Illinois at Chicago, IL
2005 M.S., Mechanical Engineering (biomedical instrumentation), The University of Illinois at Chicago, IL
2002 B.S., Mechanical Engineering, The University of Illinois at Chicago, IL
1997 Associate Level Certified Electronic Technician (CET), Technology Center of DuPage, Addison, IL.

HONORS

05/2009—Present *Postdoctoral Fellow*, Swiss Federal Institute of Technology, EPFL
09/2008—04/2009 *Postdoctoral Fellow,* The University of Akron
01/2008—08/2008 *Research Associate*, The University of Akron
08/2007—04/2008 *Research Assistantship*, Baxter Healthcare / UIC MRC
01/2006—12/2007 *Graduate Research Assistantship*, University of Illinois at Chicago
01/2004—12/2005 *Industrial Research Assistantship*, Motorola CGISS / UIC MRC
01/2003—01/2004 *Graduate Teaching Assistantship*, University of Illinois at Chicago

EXPERTISE

Biofluid mechanics: cerebral blood flow / cerebrospinal fluid / vascular hemodynamics
Craniospinal disorders: syringomyelia / Chiari malformation / hydrocephalous
Medical instrumentation: research / design / development / medtech technology transfer
Experimental methods: electronics / DAQ / flow models / MRI / ultrasound (cerebrovascular)

POSTDOCTORAL EMPLOYMENT & TRAINING

06/2009—Present *Scientific Collaborator/Postdoctoral Fellow,* Ecole Polytechnique Fédérale de Lausanne, Laboratory of Hemodynamics and Cardiovascular Technology

- conduct novel biomedical device research and development (medtech)
- arrange clinical MRI and ultrasound studies (IRB submission / project coordination / subject recruitment)
- theoretical modeling of cerebrospinal fluid hydrodynamics and cerebral blood flow interaction

09/2009—12/2009 *Project Leader Tech. Start-up*, Venture challenge fast-track, Geneva, Switzerland

- commercial opportunity analysis, business strategy, product development and commercialization
- marketing, communications, sales negotiations, intellectual property, business finance

08/2009—Present *Cerebrovascular Ultrasound Trainee*, Department of Neurology and Department of Diagnostic and Interventional Radiology, Centre Hospitalier Universitaire Vaudois Lausanne, Switzerland

- learned cerebrovascular US measurement techniques, duplex B mode, transcranial and trans-ocular Doppler
- observed patients with various pathologies, carotid stenosis, cerebral aneurism, sickle cell anemia
- atrial septal defect, hypertension, ophthalmic artery stenosis, perfusion imaging with microbubbles

01/2008—06/2009 *Research Associate / Postdoctoral Fellow*, University of Akron, Biofluids Laboratory
- wrote research papers and completed research proposals
- assisted in purchasing of equipment and set-up of new biofluids laboratory

04/2009—Present *Webmaster & site developer*, CSFlab.com, The Cerebrospinal Fluid Laboratory Wiki
- Administrator and developer of international collaborative Wiki based CSF research laboratory webpage

INDUSTRIAL EMPLOYMENT

05/2007—12/2007 *Research and Development Consultant*, Hospira Healthcare Inc.
- assisted in development of novel IR and visible pulsed laser based biomedical instrumentation
- worked with class 3 lasers and various types of optical instrumentation
- consulted on fluid mechanics related flow problems

06/2005—08/2005 *Global Leveraged Research and Development Internship*, Baxter Healthcare
- developed biomedical sensors for medical infusion pump systems
- optimized designs through analysis of system fluid mechanics and heat transfer

05/2003—08/2003 *New Product Biomonitoring Internship*, Motorola Advanced Technology Center
- conducted patent search, brainstorming, and technical writing
- constructed and tested handheld prototype ambulatory biomedical sensors
- experimented with photoplethysmography, and electrocardiogram

05/2002—08/2002 *Design Engineer Internship*, Sencon Sensors and Controllers
- designed prototype parts using ProE assembly
- created working drawings, and tested prototype machinery
- aided in packaging, design optimization, failure testing, and part selection

06/2001—08/2001 *Electronics Technician Internship*, Sencon Sensors and Controllers
- tested and repaired electronic printed circuit boards
- read and interpreted electronic schematics diagrams

ACADEMIC EXPERIENCE

01/2002—01/2007 *Biofluids Laboratory Research Assistant*, University of Illinois at Chicago
- aided in experimental, theoretical, and computational biofluid mechanics research
- built a custom designed pulsatile computer controlled syringe pump for CSF flow simulation
- developed Matlab image and data processing algorithms for *in vivo* and *in vitro* MRI experiments

08/2003—12/2006 *Acoustics and Vibrations Lab Research Assistant*, University of Illinois
- assisted in development of a novel sensor array for detection of sounds in the body
- designed and constructed compliant ultrasound flow models using ProE
- advised on design of analog circuitry for piezoelectric sensor array

08/2004—08/2006 *Industrial Research Assistant*, Motorola Inc. CGISS and UIC MRC
- tested biomimetic flow models with laser Doppler vibrometry and transducers
- investigated hemodynamic relation of pulse wave velocity and blood pressure

09/2007—04/2008 *Industrial Research Assistant*, Baxter Healthcare, Biosurgery and UIC MRC

- performed fluid mechanics theoretical and experimental analysis
- consulted on new bio-surgery medical device development and feasibility study
- developed testing apparatus and Matlab image processing code

SUMMARY OF RESEARH ACTIVITIES

Cerebrospinal fluid system disorders

My overall research focus is in cerebrospinal fluid system (CSF) disorders, with a concentration on syringomyelia (SM) and Chiari malformation (CM). In particular, my research has investigated the underlying biomechanical and hydrodynamic mechanisms responsible for the formation of cysts in the spinal cord. This research has led to the development and testing of compliant *in vitro* flow models of the CSF system which have helped to elucidate pathological mechanisms for SM and CM. These models were shown to be hydrodynamically and geometrically similar to patients through detailed MR and laboratory experiments. More recent work includes interest in developing theoretical models for the communication between CSF and cerebral blood flow. I am particularly interested in developing a model which amalgamates knowledge of tissue geometry and compliance along with the influence of intracranial, spinal, arterial, and venous system pressure to help better understand mechanisms for cyst formation in the spinal cord and hydrocephalous.

Biomechanical properties of the spinal cord and canal

My research has also investigated soft-tissue biomechanics of neural tissue. This work has primarily included developing non-invasive techniques for assessment of mechanical properties of the spinal cord and canal such as compliance. This research has led to the development of a novel non-invasive magnetic resonance imaging (MRI) technique for measurement of CSF velocity wave speed (VWS) in the spinal subarachnoid space. I am interested in using this measurement technique to develop clinical tools for non-invasive diagnosis and assessment of craniospinal disease severity. This work has included *in vitro* validation studies for MR VWS techniques and theoretical modeling of CSF wave propagation in the spinal subarachnoid space.

Biomedical instrumentation

In addition to CSF system and biomechanical properties work, I have been interested in development of novel biomedical instrumentation. See patent section for more information. This work has included development of:

- improved surgical tool for abdominoplasty surgery
- improved abdominal aortic graft
- ambulatory blood pressure monitoring device using plethysmography array
- laser based flow measurement device for drug infusion
- compliant flow models with sub-surface stenosis
- computer controlled flow pump for producing physiologically accurate CSF waveform
- compliant cerebrospinal fluid system model with spinal stenosis and syrinx
- non-invasive laser based thermal infrared time-of-flight flow metering device
- technique for characterization of viscoelastic properties of biological soft-tissues
- technique for making viscoelastic biocompatible physiological flow models for ultrasound imaging
- new acoustic skin-contact hydrophone sensor array pad for medical diagnosis and monitoring

JOURNAL PAPERS

Published / Accepted:

1. **B. A. Martin**, F. Loth, “The Influence of Coughing on Cerebrospinal Fluid Pressure in an *In vitro* Syringomyelia Model with Spinal Canal Stenosis,” (published, December 2009).
2. **B. A. Martin**, F. Loth, “Detailed Subarachnoid Space Pressure Measurements in an *In vitro* Spinal Stenosis Model: Implications on Hydrodynamic Syringomyelia Theories,” (in press, May 2009).
3. **B. A. Martin**, W. Kalata, F. Loth, T.J. Royston, J.N. Oshinski, "Syringomyelia hydrodynamics: an *in vitro* study based on *in vivo* measurements, " Vol. 127, No. 7, pp. 1110-1120, Journal of Biomechanical Engineering, (published, December 2005).

4. W. Kalata, **B. A. Martin**, F. Loth, T. J. Royston, J. N. Oshinski, "MR Measurement of Pulse Wave Velocity in the Spinal Canal," IEEE Engineering in Medicine and Biology Society, Transactions on Biomedical Engineering (published, January 2009).
5. Y. Yazicioglu, T. J. Royston, T. Spohnholtz, **B. A. Martin**, F. Loth and H. Bassiouny, "Acoustic radiation from a fluid-filled, subsurface vascular tube with internal turbulent flow due to a constriction," Journal of the Acoustical Society of America 118 (2), 1193 – 1209 (published, 2005).

In progress:

1. **B. A. Martin**, F. Loth, "Spinal subarachnoid space shunting with cerebrospinal fluid flow stenosis," (in progress, 2010).
2. **B. A. Martin**, F. Loth, T.J. Royston, J.N. Oshinski, "Elastic Properties of the Spinal Canal," (in progress, 2010).
3. **B. A. Martin**, F. Loth, "Quantification of Spinal Cord Motion Pre and Post Spinal Decompression Surgery," (in progress, 2010).
4. **B. A. Martin**, F. Loth, "Non-invasive Method for Measurement of Spinal Canal Elastance," (in progress, 2010).
5. **B. A. Martin**, N. Stergiopulos, P. Reymond, "An *in silico* simulation of the cerebrospinal fluid velocity wave in the spinal canal," (in progress, 2010).
6. **B. A. Martin**, F. Loth, et al. "A comparison of *in vitro* and *in silico* simulations of syringomyelia with spinal canal stenosis," (in progress, 2010).

EXTENDED CONFERENCE PROCEEDINGS (greater than 2 pages)

1. Y. Yazicioglu, **B. A. Martin**, K. Navarro, T. J. Royston, "Transverse vibration of pre-stressed beams: An experimental technique for the determination of dynamic viscoelastic material properties of tissue mimicking materials," 152nd Meeting of the Acoustical Society of America (Paris, France, 5/29-6/4, 2008).

ABSTRACTS AND PRESENTATIONS

1. Y. Liu, **B. A. Martin**, T. J. Royston, F. Loth, "A fluid structure interaction simulation of the cerebrospinal fluid, spinal cord, and spinal stenosis present in syringomyelia," ASME Summer Bioengineering Conference (Naples, FL, 6/16-19, 2010).
2. **B. A. Martin**, F. Loth, "Syringomyelia Biomechanics," 6th World Congress on Biomechanics (Singapore, 09/1-6).
3. **B. A. Martin**, S. El-Khoury, F. Loth, "The Influence of Cerebrospinal Fluid Flow Frequency and Magnitude on Subarachnoid Space Pressure Fluctuations in an *In vitro* Syringomyelia Model with Spinal Canal Stenosis," Biomedical Engineering Society Annual Meeting (Pittsburgh, Pa, 10/7-10).
4. **B. A. Martin**, F. Loth, T. J. Royston, "The Interrelation of Cerebrospinal Fluid Pulse Wave Velocity and Biomechanical Properties of the Spinal Canal," 10th US National Congress on Computational Mechanics, Mechanics of biological Tissues Mini-Symposium (Columbus, Ohio, 7/16-19, 2009).
5. **B. A. Martin**, F. Loth, "The Influence of Coughing on Cerebrospinal Fluid Pressure in an *In vitro* Syringomyelia Model With Spinal Canal Stenosis," ASME Summer Bioengineering Conference (Lake Tahoe, CA, 6/17-21, 2009).
6. **B. A. Martin**, T. J. Royston, J. N. Oshinski, F. Loth, "Towards Non-invasive Assessment of the Elastic Properties of the Spinal Aqueduct," ASME Summer Bioengineering Conference (Lake Tahoe, CA, 6/17-21, 2009).
7. **B. A. Martin**, R. Labuda, T. J. Royston, J. N. Oshinski, B. Iskandar, F. Loth, "Pathological Biomechanics of Cerebrospinal Fluid Pressure in Syringomyelia: Fluid Structure Interaction of an *In vitro* Coaxial Elastic Tube System," ASME Summer Bioengineering Conference (Lake Tahoe, CA, 6/17-21, 2009).
8. F. Loth, **B. A. Martin**, "Engineering & Imaging Techniques," American Syringomyelia Alliance Project Annual Conference (Washington D.C., July, 2008) presentation
9. F. Loth, **B. A. Martin**, "Engineering & Imaging Techniques," Chiari Research Conference 2008, State of the Research and New Directions (Chicago, IL, 11/6-7, 2008) presentation.
10. **B. A. Martin**, Wojciech Kalata, Francis Loth, John N. Oshinski, Michael Jerosch-Herold, "MR Measurement of Pulse Wave Velocity in the Spinal Canal," ASME Summer Bioengineering Conference (Marco Island, FL, 6/25-29, 2008) abstract.
11. **B. A. Martin**, J. Seil, F. Loth, S. McCormack, T. J. Royston, "Epithelial Cell Growth on Compliant Biomaterial (Nusil CF11)," Biomedical Engineering Society Annual Meeting (Chicago, Illinois, 10/11-14, 2006) poster.

12. **B. A. Martin**, "Syringomyelia Apparatus Demonstration," UIC/Conquer Chiari Research Symposium (Chicago, Illinois, 6/2, 2007) presentation.
13. W. Kalata, **B. A. Martin**, F. Loth, T. J. Royston, J. N. Oshinski, Jerosch-Herold, "Measurements of Pulse Wave Velocity in the Spinal Canal," Biomedical Engineering Society Annual Meeting (Chicago, Illinois, 10/11-14, 2006) presentation.
14. E. Mason, **B. A. Martin**, Y. Yazicioglu, F. Loth, T. J. Royston, I. Nicolaescu, "*In vitro* and *In vivo* Piezoelectric Sensor for Measurement of Pulse Wave Velocity," Biomedical Engineering Society Annual Meeting (Chicago, Illinois, 10/11-14, 2006) poster.
15. **B. A. Martin**, W. Kalata, F. Loth, J. N. Oshinski, T. J. Royston, "Characterization of pressure wave transmission in a fluid filled syrinx," Biomedical Engineering Society Annual Meeting (Chicago, Illinois, 10/11-14, 2006) poster.
16. **B. A. Martin**, W. Kalata, F. Loth, T.J. Royston, J. N. Oshinski, "An Engineering Approach to Understanding the Hydrodynamics of Syringomyelia," ASAP Annual National Conference (Cedar Rapids, Iowa, 7/20-23, 2005) presentation.
17. T. Spohnholtz, T. J. Royston, Y. Yaziciolgu, **B. A. Martin**, F. Loth, H. Bassiouny, "A multimode sonic & ultrasonic diagnostic imaging system with application to peripheral vascular characterization," 149th Meeting of the Acoustical Society of America (Vancouver, Canada 5/16-20 2005) presentation.
18. W. Kalata, **B. A. Martin**, F. Loth, J.N. Oshinski, "Differences in cerebrospinal fluid motion in Chiari malformation patients and healthy volunteers," 3rd Annual Neural Hydrodynamics Symposium (Cleveland, OH, 5/12-14, 2005) presentation.
19. **B. A. Martin**, W. Kalata, F. Loth, J.N. Oshinski, T. J. Royston, "Experimental Syringomyelia Hydrodynamics: The Importance of Pressure Phase Relation on Syrinx Pathogenesis," 3rd Annual Neural Hydrodynamics Symposium (Cleveland, OH, 5/12-14, 2005) presentation.
20. **B. A. Martin**, W. Kalata, F. Loth, T. J. Royston, J.N. Oshinski, "An Experimental Investigation of the Hydrodynamic and Biomechanical Environment Present in Syringomyelia," ASME Summer Bioengineering Conference (Vail, CO, 5/22-26, 2005) abstract.
21. T. Spohnholtz, T. J. Royston, Y. Yaziciolgu, **B. A. Martin**, F. Loth, H. Bassiouny, "Helping doctors interpret the sound of blood using a multimode sonic and ultrasonic imaging system," 149th Meeting of the Acoustical Society of America, lay language paper (Vancouver, Canada, 05/16-20, 2005) abstract.
22. Y. Yazicioglu, T. J. Royston, T. Spohnholtz, **B. A. Martin**, F. Loth, H. Bassiouny, "Coupled vibration and sound radiation from a fluid-filled and submerged or embedded vascular tube with internal turbulent flow due to a constriction," 149th Meeting of the Acoustical Society of America (Vancouver, Canada, 05/16-20, 2005) abstract.
23. **B. A. Martin**, W. Kalata, J.N. Oshinski, F. Loth, "An Engineering Perspective on Syringomyelia," ASAP Annual National Conference (Key Biscayne, FL, 6/21-24, 2004), presentation.
24. **B. A. Martin**, W. Kalata, T.J. Royston, J.N. Oshinski, F. Loth, "Experimental Study on Pressure and Hydrodynamic Flow within the Subarachnoid Space," 2nd Symposium of Neural Hydrodynamics (Menlo Park, CA, 5/1, 2004), presentation.
25. **B. A. Martin**, F. Loth, J.N. Oshinski, "Physical Characterization of Pressure Wave Transmission in a Fluid Filled Syrinx," Proceedings of the Neurohydrodynamic Symposium (6/2004), presentation.
26. W. Kalata, **B. A. Martin**, et. al, "Hydrodynamics of Cerebrospinal Fluid in Spinal Canal with Chiari Malformation and Syringomyelia," Bioengineering Session, American Society of Mechanical Engineers National Conference (Anaheim, CA, 11/13-19, 2004) poster.
27. **B. A. Martin**, W. Kalata, J.N. Oshinski, F. Loth, T.J. Royston, "Construction and validation of a complaint model of the cerebrospinal fluid system with fluid filled syrinx", 2004 ASME International Mechanical Engineering Congress & Exposition (Anaheim, CA ,11/13-19, 2004) abstract.
28. W. Kalata, **B. A. Martin**, F. Loth, T. J. Royston, J.N. Oshinski, "Hydrodynamics of Cerebrospinal Fluid in Spinal Canal with Chiari Malformation and Syringomyelia," Bioengineering Poster Session, American Society of Mechanical Engineers National Conference (Anaheim, CA, 11/13-19, 2004) abstract.
29. Y. Yazicioglu, T. J. Royston, T. Spohnholtz, **B. A. Martin**, F. Loth, "Coupled vibration of a fluid-filled and submerged vascular tube with internal transitional / turbulent flow due to a constriction," in Proceedings of the 148th Meeting of the Acoustical Society of America, (San Diego, CA, November 2004) abstract.

30. **B. A. Martin**, W. Kalata, J.N. Oshinski, F. Loth, "Importance of Mechanical Forces in the Development of Syringomyelia for Patients With Chiari Malformation," ASAP Annual Conference (New York City, NY, 7/2003), presentation.
31. **B. A. Martin**, W. Kalata, J.N. Oshinski, F. Loth, "Engineering Perspective on Diseases Related to CSF Motion," University of Chicago in the Department of Neurosurgery Grand Rounds (Chicago, IL, 6/6/2003), presentation.

TECHNICAL REPORTS

1. **B. A. Martin**, F. Loth, "Importance of Mechanical Forces in the Pathogenesis of Syringomyelia," project report submitted to American Syringomyelia Alliance Project (2009).
2. J. Stevens, **B. A. Martin**, "Feasibility Study: Tisseel Delivery Device for Abdominoplasty," technical report submitted to Baxter Laboratories (confidential) (2007).
3. **B. A. Martin**, "Optical Time of Flight System Documentation," technical report submitted to Hospira Inc. (confidential) (2007).
4. **B. A. Martin**, A. Yardimci, J. Slepika, "IR Time of Flight Flow Sensor Analysis," technical report submitted to Baxter Laboratories Technology Resources (2005).
5. **B. A. Martin**, "Ambulatory Blood Pressure Monitoring of Firefighters," technical report submitted to Motorola Inc. (2003).

INVITED LECTURES AND WORKSHOPS

6. **B. A. Martin**, "An Engineering Analysis of Syringomyelia," University of Illinois at Chicago, Department of Radiology, MRI Research Laboratory (Chicago, Illinois, 10/24, 2008), invited lecture.
7. **B. A. Martin**, "*In vitro* Syringomyelia Hydrodynamics," Ecole Polytechnique Fédérale de Lausanne (Lausanne, Switzerland, 9/16, 2008) invited lecture.
8. **B. A. Martin**, "Syringomyelia Biomechanics," National Institute of Health (Bethesda, Maryland, 2/5/2008), invited lecture.

PATENTS

Published:

1. US 2006/0089557 A1, "Method and Apparatus to Facilitate Heart Rate Detection," Liliana Grajales, **B. A. Martin**, Ion V. Nicolaescu, Iwona turlik. Motorola, Inc., Oct. 27, 2004.

INVENTION DISCLOSURES

Completed:

1. **B. A. Martin**, "Device and method for non-invasive measurement of cerebrovascular properties," invention disclosure (filed December 11th, 2009, Ecolé Polytechnique Fédérale de Lausanne, Switzerland).
2. **B. A. Martin**, "Automated Laser Aspiration System," invention disclosure (filed July 15th, 2009, Ecolé Polytechnique Fédérale de Lausanne, Switzerland).
3. **B. A. Martin**, F. Loth, "Cerebrospinal Fluid System Model," invention disclosure (filed March 4th, 2009, The University of Akron).
4. **B. A. Martin**, F. Loth, "System and Method for Research of Patient Entered Medical Information," (filed March 24th, 2009, The University of Akron).
5. F. Loth, **B. A. Martin**, R. Labuda, J. Oro, J. N. Oshinski, "Device and Method for Measurement of Tension and Elastic Properties of the Spinal Cord and Filum Terminale," (filed March 2nd, 2009, The University of Akron).
6. T. J. Royston, Spohnholtz, F. Loth, Y. Yazicioglu, **B. A. Martin**, "A multimode sonic & ultrasonic diagnostic imaging method," invention disclosure (filed March, 2004, University of Illinois at Chicago).
7. T. J. Royston, Spohnholtz, F. Loth, **B. A. Martin**, "New acoustic skin-contact hydrophone sensor array pad for medical diagnosis and monitoring," invention disclosure (filed March, 2004, University of Illinois at Chicago).

In preparation:

1. **B. A. Martin**, "3D Quantum Dot Hydrophone," invention disclosure (*in preparation*).
2. **B. A. Martin**, "Fiber-optic Quantum Dot Probe," invention disclosure, (*in preparation*).
3. **B. A. Martin**, "Biomimetic Piezoelectric Electrospun Transducer," invention disclosure (*in preparation*).

4. **B. A. Martin**, "Syringe for Physiological Pressure Measurements," invention disclosure (*in preparation*).
5. **B. A. Martin**, "Remote Window System," invention disclosure (*in preparation*).

SUMMARY OF TEACHING AND MENTORING

Teaching Assistantship:

University of Illinois at Chicago, Fluid Mechanics and Heat Transfer TA, 2003
University of Illinois at Chicago, Fluid Mechanics Laboratory TA, 2006

Graduate student mentorship:

Serge El-Khoury, Cleveland Clinic and Kent State University – Spring 2009

Undergraduate student mentorship (UIC Undergraduate Research ME-494):

Justin Stevens, Spring 2007– Spring 2008
Jennifer Frederick, Spring – Fall 2007
Hardik Shah, Spring 2006 – Fall 2007
Edith K. Gómez, Fall 2004
Anastasios Kotsakos, Spring – Fall 2004
Rex Villasin, Fall 2003 – Spring 2004
Richard Paulsen, Summer 2004
Steven Cespedes, Summer 2004
Sebastien Nicolaon, Summer 2004

PROFESSIONAL SOCIETIES

International Society for Cerebral Blood Flow and Metabolism (ISCBFM), 2009 - Present
American Society of Mechanical Engineers, 2004 - 2006
American Syringomyelia Alliance Project, 2006 - 2007
Acoustical Society of America, 2005
Biomedical Engineering Society, 2006
Engineers Without Borders U.S.A., 2003 - 2007
University of Illinois at Chicago Engineering Graduate Student Council 2003 - 2007

PROFESSIONAL ACTIVITIES

Journal reviewer for:

Journal of Biomechanical Engineering

Scientific advisory board membership:

Research fellow of the Canine Chiari & Syringomyelia Institute, 2009 - Present

SKILLS

Skill (yrs. of experience):

computer languages	**computer software**	**electronic equipment**	**technical equipment**	**sensors transducers**

HTML (10) C++ (2) web admin. (10) web page admin for: - csflab.com - biofluids.net - fluxeng.com - ewb-uic.org - syeld.org - pinklemusic.com - fandanguero.com - projectfocus.org - quadmagazine.org	Matlab (8) Labview (6) Pro Engineer (8) Pro Mechanica (1) AutoCAD (1) Microstation J (1) FTP (10) LaTex (2) MS office (14) Photoshop (12) Illustrator (1) ProTools (3) Sonar (14)	multimeter (18) Fn generator (16) power supplies (16) amplifiers (16) motors (16) analog signal processing (14)	MRI (8) Ultrasound / Doppler / TCD (1) laser Doppler vibrometer (6) laser Doppler anemometer (2) lasers (2) optics signal analyzer (2) photoplethysmography (2) laboratory microscopes (1) electrocardiogram (2) high speed CCD cameras (1) thermal cameras (2) rapid prototype (1)	resistance temperature (2) hot-wire anemometer (1) strain gauges (1) diaphragm (10) piezoelectric (10) microphones (16) photodiodes (10) encoders (2)

NON-ACADEMIC INVOLVEMENT

Community and Social:

- brick stove builder, Tecnologías para la Salud - NGO, Chimaltenango, Guatemala, 2006
- project leader, Engineers Without Borders, University of Illinois at Chicago, Chicago, IL, 2003–2007
- guitar teacher, School for the Arts, Chicago, IL, 2005–2007
- open-mic host, Café Mestizo, Chicago, IL, 2005-2007
- webmaster and funding contributor, Project Focus, Chicago, IL and Uganda, Africa, 2006–Present
- webmaster, seyld.org, employment for youth with learning disabilities, Chicago, IL, 2009–Present
- webmaster, quadmagazine.org, creative publication of Grove City College, Grove City, PA, 2008–Present
- publisher and writer in the American Society of Composers Authors and Publishers (ASCAP), 2009–Present

Misc job experience:

- sailing instructor, Waquoit Bay Yacht Club, Waquoit, Ma, 1998–2001
- musical instrument repair technician (clarinet, flute, oboe), Ellman's Music Center, Naperville, IL, 2000
- pipe organ repair technician, Daniel Bogue Associates, Downers Grove, IL, 1998–2002

Accomplishments:

- wrote, recorded 300+ original songs published in 25+ musical albums
- performed music at the Chicago House of Blues 12 times
- two-time competitor in the North American 420, Knockabout, and sunfish sailboat racing championships
- built one classical guitar and three electrical guitars

Hobbies:

Playing and recording music, electronic experiments, bike riding, house plants, gardening, sailing, bird watching, outdoor recreation, building guitars, reading, woodworking, traveling.