

Matthew Corbin Wiggins

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Address: 25 Teel Street, Arlington, Massachusetts 02474 (770.596.1765)

OBJECTIVE: Work within a team setting to apply skills in signal processing, statistics, data mining, and pattern recognition techniques in the development of novel algorithms and systems.

EDUCATION: Georgia Institute of Technology, Atlanta, Georgia
PhD in Bioengineering, August 2007
Minor in Biochemistry/Physiology
Dissertation: Bayesian-based Risk Stratification of Atrial Fibrillation in Coronary Artery Bypass Graft Patients
Overall GPA: 3.63

Georgia Institute of Technology, Atlanta, Georgia
Masters of Science in Electrical Engineering, May 2007
Digital Signal Processing (Biosignal, Image, and Speech)
Overall GPA: 3.63

Georgia Institute of Technology, Atlanta, Georgia
Bachelor of Science in Electrical Engineering, December 2002
Minor in Biomedical Engineering
Overall GPA: 3.73 summa cum laude

Relevant Coursework: Biosignal Analysis, Advanced Digital Signal Processing, Digital Image Processing, Digital Speech Processing, Statistics, Bayesian Statistics, Artificial Intelligence Systems Anatomy and Physiology, Pathophysiology, Muscle, Nerve, and Bone Physiology, Biochemistry I & II, Bioelectronics, Quantitative Electrophysiology, Biosensors, Biomedical Instrumentation, Medical Imaging Systems

RELATED EXPERIENCE:

TIAX, LLC

Senior Technologist – Signal Processing Engineer 4/07-present

- Leads efforts to develop novel methods for deciphering traditional diagnostic health indicators from previously underutilized biological signals resulting in greater accuracy, broader application, and improved physiological monitoring
- Provides signal processing support to a variety of projects: engine efficiency improvements, unmanned aerial vehicle ground surveillance, predictive stochastic signal processing for navigational guidance
- Intellectual property analysis and development using Aureka

Georgia Tech – Intelligent Control Systems Lab, Biomedical Group

Graduate Research Assistant (funded by a DANA Grant) 1/03-4/07

- Created, implemented, and tested new algorithms for diagnosis and risk stratification of cardiac patients using statistics, biosignal processing, pattern recognition, and data mining on clinically collected data
- Coordinated cardiologists and neurologists the University of Pennsylvania Hospital, Emory University, and the Atlanta Veterans Affairs Medical Center to collect and analyze data and publish results

Raptor International

Clinical Study Consultant 5/06-11/06

- Initiated investigational clinical study of the occurrence of complications and readmission following cardio-thoracic surgery for potential commercial software package to aid hospitals in Continuous Quality Improvement (CQI) initiatives.
- Identified and organized thoracic surgeons and acted as a liaison between physicians and Raptor International.
- Authored preliminary IRB documentation and protocol
- Organize and analyze data to accomplish study objectives

- Publish and present findings in cooperation with physicians and Raptor International

Georgia Tech – Intelligent Control Systems Lab, Biomedical Group

Undergraduate Research Assistant 5/02-12/02

- Implemented and tested existing algorithms for cardiac arrhythmia prediction
- Developed, implemented, and tested hypotheses of new cardiac arrhythmia detection/prediction and biosignal analysis techniques

Georgia Tech Microelectronics Lab

Teaching Assistant 5/02-12/02

- Instructed students regarding analog and digital circuit design.
- Taught correct usage of electronics lab equipment.

Medside Home Health Agency

Student Assistant 1/02-5/02

- Designed and built handheld ECG acquisition system component in a team setting.
- Designed two layer printed circuit board (PCB) layout for ECG acquisition system.

Motorola Corporation, Atlanta, Georgia

Commercial, Government, Industrial Solutions Sector Intern 5/01-8/01

- Assisted Radio System Engineering Team on fire-station alerting system design
- Built a Motorola Radio programming lab focused on efficiency and cycle time reduction
- Conducted acceptance testing of Bibb County Radio Trunking System
- Researched and proposed policies for field testing equipment which led to reduced department spending and cycle time

Motorola Corporation, Decatur, Georgia

Commercial, Government, Industrial Solutions Sector Intern 5/00-8/00

- Created Web-interactive database to hold, update, display, and search accounts, which facilitated information sharing between divisions. System features included administrative access with username and password security.
- Created a Decision Support System to guide engineers through choices and needed forms during the creation of a new project, facilitating standardized designs and reduced cycle time. The system included a database to hold each user's forms and project status.

SKILLS AND STRENGTHS:

- Languages: Matlab, Java, HTML, PHP, JavaScript, VBScript, SQL, Perl, VHDL, and Verilog
- Programs: Matlab, Aureka, Microsoft Office Suite, Dreamweaver, UNIX systems
- Pattern Recognition, Self-Organizing Maps, Genetic Programming, Bayesian statistics and networks, Neural networks, Independent and Principle component analysis, Biosignal processing (electrocardiogram (ECG), electroencephalogram (EEG), etc.), Wavelet analysis
- Experience in web design (<http://www.matthewcwiggins.com/>)
- Goal oriented self starter
- Enthusiastic and passionate collaborator
- Dependable, highly organized individual, with proven leadership skills

HONORS AND ACTIVITIES:

- Dean's List, 1998-present
- IEEE, 2000-2002
- Eta Kappa Nu, 2000-present, President (2003), Vice President (2002)
- Jazz Band President
- Louis Armstrong Jazz Award, 1998
- Eagle Scout, 1994-present
- Recipient of Governor's Honor, Cobb County GT Alumni Association, and Hope Scholarships

INTERESTS: Music Performance, Woodworking, Web-design/administration, Racquetball, and Jogging

PUBLICATIONS & PRESENTATIONS:

- Matthew Wiggins, Hiram Firpi, Raul Blanco, Muhammad Amer, and Samuel Dudley, [Prediction of Atrial Fibrillation Following Cardiac Surgery Using Rough Set Derived Rules](#). Proceedings of the 28th Annual International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC '06), 30 Aug. - 3 Sept. 2006, New York City, New York, USA. pp. 4006-4009. (Presented 1 Sept. 2006)
- Matthew C. Wiggins, Hiram A. Firpi, Edward P. Gerstenfeld, George Vachtsevanos, and Brian Litt, [Electrogram Changes Precede Atrial Fibrillation After Coronary Artery Bypass Graft](#), Computers in Cardiology, 2006, 17-20 Sept. 2006. (Accepted May 24th 2006)
- Matthew C. Wiggins, Edward P. Gerstenfeld, George Vachtsevanos, and Brian Litt, [Electrogram Features are Superior to Clinical Characteristics for Predicting Atrial Fibrillation After Coronary Artery Bypass Graft Surgery](#), 2006 Conference of the American College of Cardiology (ACC 2006) . (Presented March 13th 2006)
- Matthew Wiggins, Ashraf Saad, Brian Litt and George Vachtsevanos, [Evolving a Bayesian Classifier for ECG-based Age Classification in Medical Applications](#), Journal of Applied Soft Computing (JASC). (Accepted – In print)
- Matthew Wiggins, Ashraf Saad, Brian Litt and George Vachtsevanos, [Genetic Algorithm-Evolved Bayesian Network Classifier for Medical Applications](#), Tenth World Soft Computing Conference and Transactions (WSC'10 2005), Sept 19-Oct 7, 2005.
- Matthew Wiggins, Lichu Zhao, George Vachtsevanos and Brian Litt, [Non-Invasive, Cardiac Risk Stratification Using Wavelet Coefficients](#), WSEAS Conference and Transaction on Computers, p720-722, Vol2(3), 2003.
- Lichu Zhao, Matt Wiggins and George Vachtsevanos, [Premature Ventricular Contraction Beat Detection Based On Symbolic Dynamics Analysis](#), 3rd Proceedings of the IASTED International Conference on Circuits, Signals and Systems, p48-50, May 19-21 2003, Cancun, Mexico.
- Lichu Zhao, Matthew Wiggins, George Vachtsevanos and Brian Litt, [Risk Stratification Based on Multiple Features](#), IEEE International Symposium on Signal Processing and Information Technology (ISSPIT 2003).

REFERENCES: References provided on request.