

# MATEO ABOY

## Contact Information

---

Mail: 4099 NW Scottsdale Dr, Beaverton, OR 97006

Email: [mateoaboy@ieee.org](mailto:mateoaboy@ieee.org) | Website: [www.mateoaboy.com](http://www.mateoaboy.com) | [www.aboypatentlaw.com](http://www.aboypatentlaw.com)

## Education

---

**University of Vigo, ETSIT, Spain, EU**  
PhD in Electrical Engineering: Statistical Signal Processing

**University of London, UK, EU**  
MBA in International Management (In progress)

**Massachusetts Institute of Technology, Sloan, MA, USA**  
Executive Certificate in Management & Leadership: Technical Management  
(Four MIT Sloan MBA-based courses)

**University of California-Berkeley, CA, USA**  
Graduate/Professional Coursework in Intellectual Property Law

**University of Vigo, ETSIT & MEC, Spain, EU**  
MS (DEA) in Telecommunications Engineering  
Engineer degree in Telecommunications Engineering

**Portland State University, OR, USA**  
MS in Electrical & Computer Engineering  
BS in Electrical Engineering  
BS in Physics with a Minor in Mathematics

**Academic Honors:** BS, High Honors (Summa Cum Laude); BSEE, High Honors (Summa Cum Laude), Outstanding Undergraduate Student Award, Outstanding Senior Project Award, National Research Society, National Engineering Honor Society, International Engineering Honor Society, Golden-Key Honor Society; MSEE (Summa Cum Laude), Outstanding Graduate Student Award; MS (DEA) & PhD, (Summa Cum Laude), Intel Faculty Fellow.

## Bar Admissions

---

Bar Admission to Practice Patent Law before the United States Patent & Trademark Office (USPTO)

Patent Agent, Registration Number 64040, United States Patent Office

## Profile

---

Experienced professional with unique combination of technical, managerial, and leadership capabilities

Demonstrated innovation track record (over 60 peer-reviewed publications) & patents

Languages: English, Spanish, Galician, Portuguese, Italian (reading), German (1st year college)

US Legal Permanent Residency (EB1-Outstanding Researcher) & European Union Resident.

## Professional Experience (Non-Academic)

---

### **ABOY & ASSOCIATES, PC | [www.aboypatentlaw.com](http://www.aboypatentlaw.com) (2009-Present)**

**Profile:** IP Engineering & Patent Law Firm (Professional Corporation).

**Position/Title:** Senior Partner | Patent Agent

#### **Summary of Responsibilities:**

- Expert Services: Expert Opinions in Biomedical Signal Processing, Medical Devices, and DSP.
  - Strategy: Intellectual Property (Patent) Strategy Development.
  - Analysis: Conduction Prior-Art Searches, Patentability Opinions, and Patent Portfolio Analysis.
  - US Patent Preparation & Filing: Preparing & Filing Provisional, Utility, and Design Applications.
  - US Patent Prosecution: Elections, Amendments, Office Actions, and RCE.
  - US Continuations: Preparing & Filing Continuations, Continuations-in-Part and Divisionals.
  - International Applications: Preparing & Filing PCT Applications & National Stage .
  - Training & Education: Corporate training on innovation, patent fundamentals, development of patent strategy, university lecturing (Workshops on Patent Fundamentals for Engineers & Managers).
- Principal Practice Areas:** Signal Processing, Biomedical Signal Processing, Medical Devices, Electrical Engineering, Financial Engineering, and Business Methods

### **ABOY FINANCIAL MARKETS | [www.aboyfinancial.com](http://www.aboyfinancial.com) (2008-Present)**

**Profile:** Financial Markets, Financial Time-Series Analysis, Energy Markets.

**Position/Title:** Principal

#### **Summary of Responsibilities:**

- Newsletter/Blog focused on financial time series analysis.
- Site devoted to evidence-based analysis of financial and commodity markets using statistical signal processing techniques.
- Analysis of setup conditions on commodity markets based on commercial activity (i.e. CFTC commitment of traders report).
- Assessment of classical and novel mechanical trading systems.
- Nonlinear and complexity analysis of financial time series.
- Seasonality studies of commodity markets including energy markets.
- Seasonality analysis of major financial indices.

### **APDM, INC, OR, USA (2007-2009)**

**Profile:** Medical Devices Company focused on Ambulatory Parkinson's Disease Monitoring

**Position/Title:** COO & CFO (2007-Present)

#### **Summary of Responsibilities:**

- C-level management, leadership & strategy formulation.
- Chief Operating Officer & Chief Financial Officer.
- Responsible for Intellectual Property Strategy and Implementation (Prosecution, License Agreements)
- Innovation and R&D.

### **TIBA MEDICAL, INC, OR, USA | [www.tibamedical.com](http://www.tibamedical.com) (2003-2009)**

**Profile:** Medical Devices Company

**Position/Title:** Principal Engineer (2003-2005), Chief Scientist (2005-2008), Chief Scientific Advisor (2008-2009)

#### **Summary of Responsibilities:**

- Research & Development.
- Innovation Strategy.
- Intellectual Property Strategy Development.
- Clinical Device Validations (510k).
- Ambulatory Blood Pressure Monitoring System Product Definition and Design.
- Designed Signal Processing Algorithms for Ambulatory Blood Pressure Monitors (Ambulo 2400).
- Designed Signal Processing Algorithms for Actigraphy.

## Professional Experience (Non-Academic) - Continuation

---

### **SIMPLEX, INC, OR, USA (2005-2009)**

**Profile:** Professional Services Firm Specialized in Integrated Strategic & Technical Consulting.

**Position/Title:** Principal Consultant (2005-2009)

#### **Summary of Responsibilities:**

- Provide integrated strategic consulting to technology firms: electrical, biomedical, medical devices.
- Strategic position analysis and development based on the delta model.
- Information brokerage, literature reviews, and prior-art searches.
- Technical & scientific consulting to assist in the preparation and prosecution of patent applications.
- IP strategy development & technology transfer consulting.
- Integrated scientific consulting: journal publication preparation, device validations, grant preparation.
- R&D contract work, Scientific & technical representations. -Scientific research.

**Representative Clients:** Tiba Medical, Inc (served as Chief Scientist from 2005-2008), OHSU (development of a PPV system), Innovatec SL (Representation, Strategy Development, Outsourcing Brokerage).

### **METHOD ENGINEERING, LLC, Spain, EU | [www.metodweb.com](http://www.metodweb.com) (2003-2009)**

**Profile:** Architectural Engineering Firm based in the European Union.

**Position/Title:** Partner and Professional Engineer (2005-2009) / Professional Engineer since 2003

Note: Currently serving on the Board and as an Emeritus Senior Partner

#### **Summary of Responsibilities:**

- General firm leadership & strategy development.
- Coordination of a team of Architects, Architectural Engineers, Construction & Industrial Engineers.
- Practicing professional engineer: responsible for the design, development, and approval of ICT projects (telecommunication infrastructure projects). ICT projects are required to be designed by a Professional Engineer (PE) licensed by the COIT (PE Body) in Spain, EU. (8 buildings as principal PE since 2005.)
- Design, development, and management of ICT projects residential buildings and commercial spaces. (200+)

**Representative Clients:** Architecture, Construction and Development Firms; Greencross Inversiones S.L; Fincas Hércules S.L.; Viacor Inmobiliaria S.L.; Promociones Rimabel S.L.; Bitantium S.L.; Rio y Juncal Arquitectos S.L

### **COMPLEX SYSTEMS LAB, Doernbecher Children's Hospital/BSP Lab, OR, USA (2000-04)**

**Profile:** Research Laboratory part of the Hospital ICU (Position funded by grants).

**Position/Title:** DSP Engineer (2000-2004)

#### **Summary of Responsibilities:**

- Perform simulation and validation of DSP systems and algorithms for biomedical signals.
- Design automatic QRS and pressure detection algorithms.
- Design novel analysis techniques for biomedical signals.
- Design signal processing and analysis algorithms for biomedical signals.
- Perform spectral and time-frequency analysis of biomedical signals.
- Conduct clinical research, publish results in conferences and journals, and mentor research assistants

### **OFFICE OF INFORMATION TECHNOLOGIES, Portland State University, OR, USA (1999-2002)**

**Profile:** Information Technology Division of State University.

**Position/Title:** Project Coordinator & Lead System Administrator, CNS-LCT (April 01-January 2002)

Team Coordinator & Systems Administrator, CNS-LCT (June 00-April 01)

Computer & Network Technician, CNS-LCT (September 99-June 00)

#### **Summary of Responsibilities:**

- Manage new IT deployments.
- IT system admin.
- Supervise a team of 9 computer and network technicians.
- Support 600+ campus computers computers.

## Academic Appointments & Experience

---

2008-Pres. :: Department Chair, Electrical Engineering & Renewable Energy Department, OIT  
2008-Pres. :: Associate Professor, Electrical Engineering & Renewable Energy Department, OIT  
2009-Pres. :: Associate Professor, Management Department, OIT  
2007-Pres. :: Associate Professor (External Joint Appointment), Biomedical Engineering Div, OHSU  
2006-Pres. :: Professor "Titular"(equiv) (Joint Appointment), DSP Doctoral Program, ETSIT-Vigo  
2006-2009. :: Program Director, EE(T), Electrical Engineering & Renewable Energy Department, OIT  
2007-2008 :: Assistant Professor (External Joint Appointment), Biomedical Engineering, OGI, OHSU  
2004-2008 :: Assistant Professor, Electrical Engineering & Renewable Energy Department, OIT  
2003-2004 :: Instructor, Engineering Transfer Program & Electronics, PCC  
2002-2003 :: Lab Instructor, Electrical & Computer Engineering, PSU

## Teaching: Selected Courses Recently Taught

---

### Doctoral Level Courses

o81T141a171 | Advanced Signal Processing | So7,So8 | ETSIT-Vigo  
o81T141a171 | Biomedical Signal Processing | o8-o9 | ETSIT-Vigo  
CSEE580/680 | Signals & Linear Systems | Fo8, Wo9 | OHSU  
BME582/682 | Nature & Analysis of Biomedical | Wo5, Wo8, Wo9 | OHSU

### Electrical Engineering, Renewable Energy Engineering, and General Engineering

EE225 | Circuits III - Laplace Transforms & Applications | S'o8, F'o8 | OIT  
EE321 | Electronics I - Introduction to Amplifiers & Semiconductors | Fo7, Fo8 | OIT  
EE322 | Electronics II - Transistor Amplifiers | Wo8, Fo9 | OIT  
REE221 | LabVIEW Programming | Wo6, Suo6,Wo7,Suo7,Wo8, Wo9 | OIT  
ENGR266 | Engineering Programming | Wo9 | OIT  
EE407 | Patent Fundamentals for Engineers | So8, So9 | OIT

### Mathematics and Statistics

MATH465 | Mathematical Statistics | Wo6 | OIT

### Electronics Engineering (Technology)

EET449 | Digital Signal Processing | Fo5, Fo6, Wo8 | OIT  
EET411 | Communication Systems | So8 | OIT  
EET407 | Statistical Signal Processing I | Fo6 | OIT  
EET407 | Statistical Signal Processing II | Wo6 | OIT  
EET463 | Reliability & Quality Control | Suo6 | OIT  
EET358 | Senior Project Proposal | Fo6,Wo7,So7,Fo7 | OIT  
EET458 | Senior Project Design | Fo6,Wo7,So7,Wo8 | OIT  
EET468 | Senior Project Evaluation | Wo7,So7, So8 | OIT  
EET423 | ASIC Design I | Fo7,Fo6 | OIT  
EET433 | ASIC Design II | Wo5 | OIT  
EET321 | Laplace Transforms & Applications | Wo5, Wo6, Wo7, Fo7 | OIT  
EET331 | Op-Amps & Applications | So5, So6, So7, So8 | OIT  
EET207 | Digital Circuits & Systems | Wo7 | OIT  
EET209 | Intro to Amps & Semiconductors | Fo6, Fo7 | OIT  
EET235 | Transistor Amplifiers | Fo6, Fo7 | OIT  
EET265 | Amplifier Frequency Response | So7 | OIT

## Research Summary: BSP

---

RESEARCH AREA: DSP, BIOMEDICAL SIGNAL PROCESSING, MEDICAL DEVICES

The overall theme of my research in this area is to develop novel engineering methods to help solve relevant biomedical problems. I'm particularly interested in problems involving the application of advanced statistical signal processing techniques to develop novel biomedical signal processing methods to analyze and extract information from physiologic signals that can help doctors make better diagnostic decisions and improve patient outcome. Additionally, I'm interested in the development of innovative medical devices & diagnostic systems that have the potential to improve patient treatment and quality of life while reducing the overall cost of healthcare. Within this area of research I'm currently working on five research lines: 1) Development of novel methods of biomedical signal processing and analysis based on the Extended Kalman Filter and its generalizations to solve classical and new problems using a unified statistical approach, 2) Development of novel methods for evaluation of antihypertensive treatment using ambulatory blood pressure monitoring (ABPM), 3) Interpretation of complex systems and nonlinear analysis techniques in the context of biomedical signal analysis and processing, 4) Development of novel methods for prediction of fluid responsiveness and fluid optimization, 5) Development of innovative ambulatory medical devices and diagnostic systems.

[For additional details visit: <http://www.mateoaboy.com>]

## Research Summary: Financial Markets, Financial Time Series Analysis

---

RESEARCH AREA: FINANCIAL TIME SERIES ANALYSIS, COMMODITIES, ENERGY MARKETS

This research area is devoted to application of statistical signal processing and modeling techniques to analysis of financial and commodity markets. Specific research problems include: 1) The re-examination of the Efficient Market Hypothesis and competitive alternatives such as Lo's Adaptive Market Hypothesis, 2) Development of novel indicators to predict commercial buying and selling Patterns in commodity markets & associated trading strategies, 3) Novel trading strategies for equity, futures, and bond markets based on advanced signal processing and complexity analysis techniques, and 4) Energy markets research including novel seasonality analyses.

[For additional details visit: <http://www.aboyfinancial.com>]

## Research Summary: IP, Strategy & Innovation

---

RESEARCH AREA: INTELLECTUAL PROPERTY, STRATEGY, AND INNOVATION

This area of research is focused on intellectual property, competitive strategy, and innovation. I'm interested in research on intellectual property strategy, IP valuation, and developing models and theoretical frameworks for examining IP strategy, and preparing review articles on "recent patents" on particular methods or technology areas. In the field of strategy, I'm primarily interested in application of the Delta Model (Hax) to various firms currently achieving competitive advantage and its generalization. I'm also interested in international business strategy, especially the organization of modern multinational enterprises. Finally, I'm interested in several problems within the field of innovation and entrepreneurship.

## Research Affiliations

---

2009- Aboy & Associates, PC, OR, USA

2005- EERE, Oregon Institute of Technology, OR, USA

2003- Bioengineering & Chronobiology Laboratories, ETSIT-Vigo, Spain, EU

2000- Biomedical Signal Processing Laboratory, BSP Lab, PSU., OR, USA

## Professional Memberships

---

PE Professional Engineer, (COIT) Professional Engineering Society (COIT No. 12684), Spain, EU  
Member National Scientific Research Society  
Member IEEE-Institute of Electrical & Electronics Engineers  
Member IEEE Engineering in Medicine & Biology Society  
Member IEEE Education Society

## Professional Service & Appointments

---

2008- Associate Editor, IEEE Engineering in Medicine & Biology (EMBC) - 3 year appointment  
2006- Associate Editor, IEEE RITA Journal (IEEE Education Society)  
2006- Scientific Committee Member, IEEE RITA Journal (IEEE Education Society)  
2006 Chair, EEG Modeling & Processing Session, IEEE Engineering in Medicine & Biology C.  
2006-08 Chair/President, IEEE Education Society (OR-Section)  
2008 Scientific Program Committee, ICMB, 2008  
2005-06 Officer, IEEE Education Society (OR-North Representative)  
2006- Reviewer, Elsevier Science/Academic Press  
2006- Reviewer, Computer Methods in Biomedicine  
2006- Reviewer, American Journal of Physiology-Heart and Circulatory Physiology  
2005- Reviewer, IEEE Transactions on Industrial Electronics  
2003- Reviewer, IEEE Transactions on Biomedical Engineering  
2003- Reviewer, IEEE EMBS Magazine  
2005- Reviewer, Medical Engineering and Physics  
2005- Reviewer, Medical & Biological Engineering & Computing  
2005- Board of Advisors, Microelectronics Engineering Technology, PCC, OR  
2005- Board of Advisors, Electronics Engineering Technology, PCC, OR  
2005- Board of Advisors, Microelectronics, Chemeketa CC, OR  
2005- Board of Advisors, Electronics & Microelectronics Technology, CCC, OR  
2001-02 President, International Electrical Engineering Honor Society (HKN), PSU-Chapter  
2001-02 Corresponding Secretary, National Engineering Honor Society (TBP), PSU-Chapter

## Awards & Honors

---

2006 Intel Faculty Fellow, Recipient of the Intel Fellowship Grant 2006  
2005 Full Member, National Scientific Research Society (Sigma Xi)  
2004 Best Paper Award, InterSymp-2004 Conference (Baden-Baden 04)  
2001 International Electrical Engineering Honor Society (HKN), Lifetime member  
2001 National Engineering Honor Society (TBP), Lifetime member  
2001 Golden-Key Honor Society, Lifetime member

## Selected Peer-Reviewed Journal Publications

### Research Area: DSP, Biomedical Signal Processing, and Medical Devices

---

1. A Novel Recursive Fourier Transform for Nonuniform Sampled Signals: Application to Heart Rate Variability Spectrum Estimation.  
Holland, A; Aboy, M.  
Med Biol Eng Comput. 2009 (Accepted, In print)
2. A Novel Method for Nonstationary Power Spectral Density Estimation of Cardiovascular Pressure Signals Based on a Kalman Filter with Variable Number of Measurements.  
Tsui, KM; Zhang, S; Chan, WY; Aboy, M  
Medical & Biological Engineering and Computing, Volume: 46, Issue: 8, 2008  
Page(s): 789-797
3. Complexity Analysis of Arterial Pressure During Periods of Abrupt Hemodynamic Change  
Hornero, R; Aboy, M; Gomez, C; Hagg, D; Phillips, C  
IEEE Transactions on Biomedical Engineering, Volume: 55, Issue: 2, 2008  
Page(s): 797-801
4. Statistical modeling of cardiovascular signals and parameter estimation based on the extended Kalman filter.  
McNames, J.; Aboy, M.  
IEEE Transactions on Biomedical Engineering, Volume: 55, Issue: 1, 2008  
Page(s): 119-129
5. Can a simulation study of T-wave alternans (TWA) resolve whether TWA is T-wave amplitude dependent?  
Cuesta-Frau D, Aboy M, Biagetti M.  
Med Biol Eng Comput. 2009 Jan 31
6. Enhanced modified moving average analysis of T-wave alternans using a curve matching method: a simulation study.  
Cuesta-Frau D, Micó-Tormos P, Aboy M, Biagetti MO, Austin D, Quinteiro RA.  
Med Biol Eng Comput. 2008, Oct ,21
7. A Statistical Model and Simulator for Cardiovascular Pressure Signals.  
Staats, C; Austin, D; Aboy, M  
Journal of Engineering in Medicine, Volume: 222, Issue: 6, 2008  
Page(s): 991-998
8. Design and implementation of a portable physiologic data acquisition system  
Vincore, K.; Aboy, M.; McNames, J.; Phillips, C.; Goldstein, B.  
Pediatric Critical Care Medicine, Volume: 8, Issue: 6, 2007  
Page(s): 563-569
9. Pulse Morphology Visualization and Analysis with Applications in Cardiovascular Pressure Signals.  
Ellis, T.; McNames, J.; Aboy, M.  
IEEE Transactions on Biomedical Engineering, Volume: 54, Issue: 9, 2007  
Page(s): 1552-1559
10. A novel automatic image processing algorithm for detection of hard exudates based on retinal image analysis.  
Sánchez CI, Hornero R, López MI, Aboy M, Poza J, Abásolo D.  
Medical Engineering Physics, Volume: June Issue: X, 2007  
Page(s): In press (online edition available)
11. Analysis of intracranial pressure during acute intracranial hypertension using Lempel-Ziv complexity: further evidence.  
Hornero R.; Aboy M.; Abásolo D  
Medical & Biological Engineering and Computing, Volume: 45, Issue: 3 2007  
Page(s): 229-239

12. Unsupervised Classification of Ventricular Extrasystoles using Bounded Clustering algorithms and Morphology Matching.  
Cuesta-Frau, D.; Biagetti, MO.; Quinteiro, RA.; Mico-Tomos, P., Aboy, M  
Medical & Biological Engineering and Computing, Volume: 45, 2007  
Page(s): 229-239
13. Reliability and Accuracy of Heart Rate Variability Metrics versus ECG Segment Duration.  
McNames; Aboy, M  
Medical & Biological Engineering and Computing, Volume: 44, Issue: 9, 2006  
Page(s): 747-756
14. Interpretation of the Lempel-Ziv complexity measure in the context of biomedical signal analysis.  
Aboy M, Hornero R, Abasolo D, Alvarez D  
IEEE Transactions on Biomedical Engineering, Volume: 53, Issue: 11, 2006  
Page(s): 2282-2288
15. An Automatic Algorithm for Stationary Segmentation of Extracellular Microelectrode Recordings.  
Aboy, M; Falkerberg, JH.  
Medical & Biological Engineering and Computing, Volume: 44, Issue: 6, 2006  
Page(s): 511-515
16. The Population RDH Index. A Novel Index and Graphical Method for Statistical Assessment of Antihypertensive Treatment Reduction Duration, and Homogeneity.  
Aboy, M.; Fernandez, J.R.; Hermina, R.C. Blood Pressure Monitoring. Volume: 11, Issue: 3, 2006 Page(s): 143-155
17. An Automatic Beat Detection Algorithm for Pressure Signals.  
Aboy, M.; McNames. J; Thong, T.; Tsunami, D.; Ellenby, M. Goldstein, B.  
IEEE Transactions on Biomedical Engineering, Volume: 52, Issue: 10, 2006  
Page(s): 1662-1670
18. Variability, Regularity, and Complexity of Time Series Generated by Schizophrenic Patients and Control Subjects.  
Honero, R.; Abásolo, D.; Jimeno, N.; Sanchez, C.; Poza, J.; J.; Aboy, M.  
IEEE Transactions on Biomedical Engineering, Volume: 52, Issue: 10, 2006  
Page(s): 210-218
19. Complex Analysis of Intracranial Hypertension using Approximate Entropy.  
Honero, R.; Aboy M.; Abásolo, D.; Wakeland, W.; Goldstein, B.  
Critical Care Medicine, Volume: 34, Issue: 1, 2006  
Page(s): 87-95
20. The Individual RDH Index. A Novel Vector Index for Statistical Assessment of Antihypertensive Treatment Reduction, Duration, and Homogeneity.  
Aboy, M.; Fernandez, J.R.; Hermina, R.C.  
Blood Pressure Monitoring. Volume: 11, Issue: 2, 2006  
Page(s): 69-78
21. Adaptive Modeling and Spectral Estimation of Nonstationary Biomedical Signals Based on Kalman Filtering.  
Aboy, M.; Márquez, O.W.; McNames, J.; Hornero, R.; Thong, T.; Goldstein, B.  
IEEE Transactions on Biomedical Engineering, Volume: 52, Issue: 8, 2005  
Page(s): 1485-1489
22. Interpretation of Approximate Entropy. Case Studies in the Analysis of Intracranial Pressure During Acute Elevations in Traumatic Brain Injury.  
Honero, R.; Aboy, M.; Abásolo, D.; McNames, J.; Goldstein, B.  
IEEE Transactions on Biomedical Engineering, Volume: 52, Issue: 10, 2005  
Page(s): 1671-1680

23. Methodological Considerations in the Evaluation of the Duration of Action of Antihypertensive Therapy Using Ambulatory Blood Pressure Monitoring. Aboy, M.; Fernandez, J.R.; Hermina, R.C.  
Blood Pressure Monitoring. Volume: 10, Issue: 3, 2005  
Page(s): 111-115
24. Pulse and Mean Intracranial Pressure Analysis in Pediatric Traumatic Brain Injury.  
Aboy, M.; McNames, J.; Wakeland, W.; Golstein, B.  
Acta Neurochirurgica (Suppl), Volume: 95 2005  
Page(s): 307-310
25. A Novel Algorithm to Estimate the Pulse Pressure Variation Index  
Aboy, M.; McNames, J.; Thong, T.; Phillips, C.R.; Ellenby, M. Goldstein, B.  
IEEE Transactions on Biomedical Engineering, Volume: 51, Issue: 12, 2004  
Page(s): 2198 - 2203
26. A Microcontroller-Based Portable Electrocardiograph Recorder.  
Segura-Juarez, J.J.; Cuesta-Frau, D.; Samblas-Pena, L.; Aboy, M.;  
IEEE Transactions on Biomedical Engineering, Volume: 51, Issue: 9, 2004  
Pages: 1686 - 1690
27. Prediction of Paroxysmal Atrial Fibrillation by Analysis of Atrial Premature Complexes.  
Thong, T.; Goldstein, B.; McNames, J.; Aboy, M.  
IEEE Transactions on Biomedical Engineering, Volume: 51, Issue: 4, 2004  
Page(s): 561-569
28. Pattern Matching Techniques Applied to Biomedical Signal Processing.  
Cuesta-Frau, D.; Mico Tormos, P.; Novak, D.; Aboy, M.  
IIAS Transactions of Systems Research and Cybernetics Volume: 4, Issue: 1, 2004  
Page(s): 29-35

## Selected Book Chapters & Peer-Reviewed Conference Publications

### Research Area: DSP, Biomedical Signal Processing, and Medical Devices

---

29. Neurologic Monitoring  
Goldstein, B.; Aboy, M.; Graham, A.  
Roger's Textbook of Pediatric Intensive Care
30. ICU Monitoring of Continuous Physiologic Signals: Engineering Aspects, Clinical Interpretation, and Future Directions  
Goldstein, B.; McNames, J.; Ellenby, M.; Ibsen, L.; Jacques, S.; Aboy, M.; Thong, T.; Phillips, C  
Crit. Care Med, Current Concepts in Pediatric Critical Care, Volume: 1, Issue: 1, 2004  
Page(s): 201-229
31. Characterization of sample entropy in the context of biomedical signal analysis.  
Aboy, M.; Cuesta-Frau, D.; Austin, D.; Mico-Tormos, P.;  
IEEE Engineering in Medicine and Biology Society (EMBS), 2007.  
Proceedings of the 27th International Conference of the IEEE, Volume: 1, 2007  
Page(s): 5942-5
32. T-wave Alternans Analysis Improvement by Means of Curve Alignment Prior to Distance Calculation.  
Cuesta-Frau, D.; Biagetti, M.; Mico-Tormos, P.; Aboy, M.; Austin, D.; Quintero, R.  
IEEE Engineering in Medicine and Biology Society (EMBS), 2007.  
Proceedings of the 27th International Conference of the IEEE, Volume: 1, 2007  
Page(s): 690-3
33. A Novel Approach to Pulse Pressure Variation  
Austin, D.; Staats, C.; Aboy, M  
IEEE Engineering in Medicine and Biology Society (EMBS), 2006.  
Proceedings of the 27th International Conference of the IEEE, Volume: 3, 2006  
Page(s): 1391-1393
34. Clustering of Intracranial Pressure Using Hidden Markov Models  
Novak, D.; Cuesta-Frau, D.; Aboy, M.; Goldstein, B.; Lhotska, L.  
EMCSR-17 European Meetings on Cybernetics and Systems Research, 2004
35. Morphology analysis of physiological signals using hidden Markov models  
Novak, D.; Lhotska, L.; Al-ani, T.; Hamam, Y.; Cuesta-Frau, D.; Mico, P.; Aboy, M.;  
Pattern Recognition, 2004. ICPR 2004. Proceedings of the 17th International Conference, Volume: 3, 2004  
Pages:754-757
36. A Novel Statistical Model for Simulation of Pressure Signals  
Aboy, M.; McNames, J.; Thong, T.  
European Association for Speech, Signal and Image Processing (EURASIP), 2004.  
Proceedings, 17th International EURASIP Conference BIOSIGNAL 2004, Volume:17  
Page(s): 364-367
37. Time-Delay Estimation between Arterial Blood Pressure and Intracranial Pressure Signals Based on Kalman Filtering  
Aboy, M.; Marquez, O.W.; McNames, J.; Cuesta-Frau, D.  
European Association for Speech, Signal and Image Processing (EURASIP), 2004.  
Proceedings, 17th International EURASIP Conference BIOSIGNAL 2004, Volume: 17  
Page(s): 355-357
38. Complex Analysis of Intracranial Hypertension in Traumatic Brain Injury using Approximate Entropy  
Hornero, R.; Abasolo, D.E.; Aboy, M.; Mcnames, J.; Goldstein, B.  
European Association for Speech, Signal and Image Processing (EURASIP), 2004.  
Proceedings, 17th International EURASIP Conference BIOSIGNAL 2004, Volume: 17  
Page(s): 15-17

39. Averaged Lomb Periodograms for Nonuniform Sampling  
Thong, T.; McNames, J.; Aboy, M.; Oken, B.  
European Association for Speech, Signal and Image Processing (EURASIP), 2004.  
Proceedings, 17th International EURASIP Conference BIOSIGNAL 2004, Volume: 17  
Page(s): 39-41
40. A Database of Oculographic Signals  
Cuesta-Frau, D.; Novak, D.; Aboy, M.; Brzezny, R.; Cerny, R.; Jerabek, J.  
European Association for Speech, Signal and Image Processing (EURASIP), 2004.  
Proceedings, 17th International EURASIP Conference BIOSIGNAL 2004, Volume: 17  
Page(s): 97-99
41. Designing Portable Biomedical Signal Recorders  
Cuesta-Frau, D.; Segura-Juarez, J.J.; Aboy, M.; Samblas-Pena, L.  
European Association for Speech, Signal and Image Processing (EURASIP), 2004.  
Proceedings, 17th International EURASIP Conference BIOSIGNAL 2004, Volume: 17  
Page(s): 155-157
42. Transient Pulse Morphology Analysis of Intracranial Pressure after Ventricular Drainage  
Aboy, M.; Crespo, C.; McNames, J.; Ellenby, M.; Goldstein, B.  
Society of Critical Care Medicine.  
Critical Care Medicine (Part 2 Suppl.), Volume: 31, Number: 12, 2003  
Page(s): 334
43. Evidence for Diminished Complexity During Acute Hypotension in Sepsis  
Aboy, M.; McNames, J.; Goldstein, B.  
Society of Critical Care Medicine.  
Critical Care Medicine (Part 2 Suppl.), Volume: 31, Number: 12, 2003  
Page(s): 229
44. Response Analysis of Intracranial Pressure to Changes in Respiratory Rate  
Levitte, G.; Aboy, M.; McNames, J.; Goldstein, B.  
Society of Critical Care Medicine.  
Critical Care Medicine (Part 2 Suppl.), Volume: 31, Number: 12, 2003  
Page(s): 333
45. Significance of Intracranial Pressure Pulse Morphology in Pediatric Traumatic Brain Injury  
Aboy, M.; McNames, J.; Cuesta-Frau, D.; Wakeland, W.; Thong, T.; Lai, S.; Gold  
IEEE Engineering in Medicine and Biology Society (EMBS), 2003.  
Proceedings of the 25th International Conference of the IEEE, Volume: 3, 2003  
Page(s): 2491-2494
46. Pulse Pressure Variation Estimation Based on Rank-Order Filters  
Aboy, M.; McNames, J.; Thong, T.; Phillips, C.R.; Ellenby, M.S.; Goldstein, B.  
IEEE Engineering in Medicine and Biology Society (EMBS), 2003.  
Proceedings of the 25th International Conference of the IEEE, Volume: 3, 2003  
Page(s): 2435-2438
47. Paroxysmal Atrial Fibrillation Prediction Using Isolated Premature Atrial Events and Paroxysmal Atrial  
Tachycardia  
Thong, T. ; McNames, J.; Aboy, M. Goldstein, B  
IEEE Engineering in Medicine and Biology Society (EMBS), 2003.  
Proceedings of the 25th International Conference of the IEEE, Volume: 1, 2003  
Page(s): 163-166
48. Morphology Analysis of Intracranial Pressure Using Pattern Matching Techniques  
Cuesta-Frau, D.; Aboy, M.; McNames, J.; Goldstein, B.  
IEEE Engineering in Medicine and Biology Society (EMBS), 2003.

- Proceedings of the 25th International Conference of the IEEE, Volume: 3, 2003  
Page(s): 2917-2920
49. Biosignal Laboratory: A Software Tool for Complete Biomedical Signal Processing  
Cuesta-Frau, D.; Mico, P.; Aboy, M.; Novak, D.; Brezny, R.; Samblas, L.; Pastor, D.; Sancho, D.  
IEEE Engineering in Medicine and Biology Society (EMBS), 2003.  
Proceedings of the 25th International Conference of the IEEE, Volume: 4, 2003  
Page(s): 3544-3547
  50. Adaptive Comb Filter for Semi-Periodic Signals  
Cyrill, D.; McNames, J.; Aboy, M.  
IEEE Engineering in Medicine and Biology Society (EMBS), 2003.  
Proceedings of the 25th International Conference of the IEEE, Volume: 3, 2003  
Page(s): 2439-2442
  51. A New Resource for Independent and Blinded Assessment of QRS Detection Algorithms  
Tsunami, D.; McNames, J.; Aboy, M. Ellenby, M.  
IEEE Engineering in Medicine and Biology Society (EMBS), 2003.  
Proceedings of the 25th International Conference of the IEEE, Volume: 3, 2003  
Page(s): 2889-2892
  52. Segmentation of Extracellular Microelectrode Recordings with Equal Power  
Falkenberg, J.H.; McNames, J.; Aboy, M.; Burchiel, K.J.  
IEEE Engineering in Medicine and Biology Society (EMBS), 2003.  
Proceedings of the 25th International Conference of the IEEE, Volume: 3, 2003  
Page(s): 2475-2478
  53. Stationarity of Ultra-Short Heart Rate Variability Measures  
Thong, T. ; Kehai, L; McNames. J; Aboy, M. Goldstein, B  
IEEE Engineering in Medicine and Biology Society (EMBS), 2003.  
Proceedings of the 25th International Conference of the IEEE,, 2003  
Page(s): 2424-2427
  54. Transient Pulse Morphology Analysis of the Intracranial Pressure Signal After Ventricular Drainage  
Aboy, M.; McNames. J.; Wakeland, W.; Ellenby, M.; Desiree, H.; Lai, S.; Goldstein, B.  
International Symposium Intracranial Pressure and Brain Monitoring, 2003.  
Proceedings of the 12th International Symposium Intracranial Pressure and Brain Monitoring Volume,  
2003  
Page(s): 402-405
  55. Intracranial Pressure Pulse Amplitude and Mean Intracranial Pressure Analysis in Pediatric Traumatic  
Brain Injury  
Aboy, M.; McNames. J.; Wakeland, W.; Ellenby, M.; Desiree, H.; Lai, S.; Goldstein, B.  
International Symposium Intracranial Pressure and Brain Monitoring, 2003.  
Proceedings of the 12th International Symposium Intracranial Pressure and Brain Monitoring, 2003
  56. Evidence for Diminished Complexity During Intracranial Hypertension in Traumatic Brain Injury  
Aboy, M.; Crespo, C.; McNames. J; Ellenby, M; Goldstein, B.  
Society of Critical Care Medicine, December 2002.  
Critical Care Medicine, Volume: 30, Number: 12, 2002  
Page(s): A80 (355)
  57. Automatic Detection Algorithm for Physiologic Pressure Signal Components  
Aboy, M.; Crespo, C.; McNames. J; Goldstein, B.  
IEEE Engineering in Medicine and Biology Society (EMBS), 2002.  
Proceedings of the 24th International Conference of the IEEE, Volume: 1, 2002  
Page(s): 196-197

58. Harmonic Spectrogram for the Analysis of Semi-Periodic Signals  
McNames, J.; Crespo, C.; Aboy, M.; Bassale, J.; Jenkins, L.; Goldstein, B.  
IEEE Engineering in Medicine and Biology Society (EMBS), 2002.  
Proceedings of the 24th International Conference of the IEEE, Volume: 1, 2002  
Page(s): 143-44
59. A Biomedical Signal Processing Toolbox  
Aboy, M.; Crespo, C.; McNames, J.; Bassale, J.; Jenkins, L.; Goldstein, B.  
European Association for Speech, Signal and Image Processing (EURASIP), 2002.  
Proceedings of the 16th International EURASIP Conference BIOSIGNAL 2002, Volume: 16, 2002  
Page(s): 49-52 vol. 16
60. Techniques for the Visualization of Nonstationary Biomedical Signals  
McNames, J.; Bassale, J.; Aboy, M.; Crespo, C.; Goldstein, B.  
European Association for Speech, Signal and Image Processing (EURASIP), 2002.  
Proceedings of the 16th International EURASIP Conference BIOSIGNAL 2002, Volume: 16, 2002  
Page(s): 42-45 vol. 16
61. Precursors in the Arterial Blood Pressure Signal to Episodes of Acute Hypotension in Sepsis  
Crespo, C.; McNames, J.; Aboy, M.; Bassale, J.; Ellenby, M.; Lai, S.; Goldstein, B.  
European Association for Speech, Signal and Image Processing (EURASIP), 2002.  
Proceedings of the 16th International EURASIP Conference BIOSIGNAL 2002, Volume: 16, 2002  
Page(s): 206-208 vol. 16
62. Sensitive Precursors to Acute Episodes of Intracranial Hypertension  
McNames, J.; Crespo, C.; Bassale, J.; Aboy, M.; Ellenby, M.; Lai, S.; Goldstein, B.  
Proceedings of the 4th International Workshop Biosignal Interpretation, 2002  
Page(s): 303-306
63. Changes in the Blood Pressure Signal Autocorrelation Function Prior To Hypotension in Septic Shock  
Bassale, J.; McNames, J.; Ellenby, M.; Aboy, M.; Crespo, C.; Lai, S.; Goldstein, B.  
Critical Care Medicine, 2001. Volume: 29, No. 12/SS  
Page(s): A112-A113
64. Automatic Detection Algorithm of Intracranial Pressure Waveform Components  
Aboy, M.; McNames, J.; Goldstein, B.  
IEEE Engineering in Medicine and Biology Society (EMBS), 2001.  
Proceedings of the 23th International Conference of the IEEE, Volume: 3, 2001  
Page(s): 2231-2234
65. Precursors to Rapid Elevations in Intracranial Pressure  
McNames, J.; Crespo, C.; Aboy, M.; Ellenby, M.; Lai, S.; Sciabassi, R.; Goldstein, B.  
IEEE Engineering in Medicine and Biology Society (EMBS), 2001.  
Proceedings of the 23th International Conference of the IEEE, Volume: 4, 2001  
Page(s): 3977-3980

## Selected Publications

### Subject Areas: International Management, Strategy, MIS, Patent Law

---

66. The Organization of Modern MNEs is More Complicated than the Old Models of Global, Multidomestic, and Transnational  
Author: Aboy, M.  
International Business Strategy & Structure, SSRN, March, 2009.  
Available at SSRN: <http://ssrn.com/abstract=1366055>
67. Examination of the Relationship Between Charles Schwab's Business and IS/IT Strategy  
Author: Aboy, M.  
Information Systems & Technology, SSRN, March, 2009.  
Available at SSRN: <http://ssrn.com/abstract=1366570>
68. Patents in Monitoring of Movement Disorders  
Author: Aboy, M.  
Recent Patents in Biomedical Engineering (forthcoming)
69. Recent Patents Involving Methods using Complexity/Nonlinear Analysis Techniques in Medical Devices  
Author: Aboy, M.  
Recent Patents in Biomedical Engineering (forthcoming)
70. Recent Patents Involving Methods using State-Space Estimation Methods in Medical Devices  
Author: Aboy, M.  
Recent Patents in Biomedical Engineering (forthcoming)
71. Recent Patents Involving the use of Kalman Filters  
Author: Aboy, M.  
Recent Patents in Engineering (forthcoming)
72. Recent Patents Involving Medical Devices for Fluid Therapy Optimization  
Author: Aboy, M.  
Recent Patents in Biomedical Engineering (forthcoming)
73. Recent Patents Involving Medical Devices for Fluid Therapy Optimization  
Author: Aboy, M.  
Recent Patents in Biomedical Engineering (forthcoming)
74. Patents in Ambulatory Blood Pressure Monitoring  
Author: Aboy, M.  
Recent Patents in Biomedical Engineering (forthcoming)
75. Challenges Faced by HR Managers in Multinational Companies (MNCs)  
Author: Aboy, M.  
International Human Resource Management. (forthcoming)  
Available at SSRN: <http://ssrn.com/>
76. Lean Practices and Competitive Advantage  
Author: Aboy, M.  
Operations Management (forthcoming)  
Available at SSRN: <http://ssrn.com/>
77. Teaching Tools: Sample Solved Problems in International Accounting and Finance  
Author: Aboy, M.  
International Accounting and Finance (forthcoming)  
Available at SSRN: <http://ssrn.com/>
78. Teaching Tools: Sample Strategic Marketing Report  
Author: Aboy, M.  
International Marketing (forthcoming)  
Available at SSRN: <http://ssrn.com/>

## **Selected Patents, Patent Applications, Patent Application Publications & Statutory Inventions Registrations (SIR)**

---

79. Title of Invention: BLOOD PRESSURE ALGORITHM.  
Application Number: 12/052659  
Filing or 371(c) Date: 03/20/2008  
Publication Date: 09/25/2008  
Publication Number: United States Patent Application 20080234589
80. Title of Invention: AMBULATORY PATIENT MONITORING APPARATUS, SYSTEM AND METHOD.  
Application Number: 12/052674  
Filing or 371(c) Date: 03/20/2008  
Publication Date: 09/25/2008  
Publication Number: United States Patent Application 20080234587
81. Title of Invention: METHOD, SYSTEM, AND APPARATUS FOR CARDIOVASCULAR SIGNAL ANALYSIS, MODELING, AND MONITORING.  
Application Number: 12/200,995  
Filing or 371(c) Date: 08/29/2008  
Publication Date: 03/12/2009  
Publication Number: United States Patent Application 20090069647 A1
82. Title of Invention: METHOD, SYSTEM, AND APPARATUS FOR STATISTICAL EVALUATION OF ANTI-HYPERTENSIVE TREATMENT.  
Application Number: 11/756,337  
Filing or 371(c) Date: 03/20/2008  
Publication Date: 09/25/2008  
Publication Number: United States Patent Application 20080234587
83. Title of Invention: METHOD AND APPARATUS FOR EVALUATION OF FLUID RESPONSIVENESS.  
Application Number: 12/363,786  
Filing or 371(c) Date: 02-01-2009
84. Title of Invention: METHOD, SYSTEM, AND APPARATUS FOR CARDIOVASCULAR SIGNAL ANALYSIS AND MODELING, AND MONITORING.  
Application Number: 60/969,333  
Filing or 371(c) Date: 08-31-2007
85. Title of Invention: METHOD, SYSTEM, AND APPARATUS FOR EVALUATION OF FLUID RESPONSIVENESS USING LEMPEL-ZIV COMPLEXITY.  
Application Number: 61/025,309  
Filing or 371(c) Date: 02-01-2008
86. Title of Invention: COLLABORATION MARKETPLACE PLATFORM SYSTEM FOR RESEARCH AND MANAGEMENT OF CHRONIC CONDITIONS.  
Application Number: 61/051,066  
Filing or 371(c) Date: 05-07-2008
87. Title of Invention: METHOD AND APPARATUS FOR AUTOMATIC ANALYSIS OF T-WAVE ALTERATIONS.  
Application Number: 61/059,866  
Filing or 371(c) Date: 06-09-2008
88. Title of Invention: METHOD AND APPARATUS FOR CONTINUOUS MEASUREMENT OF MOTOR SYMPTOMS IN PARKINSON'S DISEASE AND ESSENTIAL TREMOR WITH WEARABLE SENSORS.  
Application Number: 61/084,336  
Filing or 371(c) Date: 07-29-2008

89. Title of Invention: SYSTEM AND APPARATUS FOR WIRELESS HIGH-FREQUENCY TEMPERATURE ACQUISITION AND ANALYSIS.  
Application Number: 61/089,545  
Filing or 371(c) Date: 08-17-2008
90. Title of Invention: COMPLETE SYSTEM AND PLATFORM FOR CONTINUOUS MONITORING AND ANALYSIS OF MOVEMENT DISORDERS.  
Application Number: 61/099,204  
Filing or 371(c) Date: 09-23-2008
91. Title of Invention: COMMUNICATION SYSTEM FOR REMOTE PATIENT VISITS AND CLINICAL STATUS MONITORING.  
Application Number: 61/117,240  
Filing or 371(c) Date: 11-24-2008
92. Title of Invention: SYSTEM AND APPARATUS FOR CONTINUOUS MONITORING OF MOVEMENT DISORDERS.  
Application Number: 61/120,485  
Filing or 371(c) Date: 12-07-2008
93. Title of Invention: INSECT REPELLENT TEXTILES WITH MICROENCAPSULATED PERMETHRIN.  
Application Number: 61/145,697  
Filing or 371(c) Date: 01-19-2009

## SELECTED GRANTS AND DONATIONS

---

1. National Science Foundation (NSF)  
Title: Increasing Access and Diversity in Technology Programs | S-STEM (2008-2012)  
Amount: \$596,214.00  
M. Aboy (Co-PI), T. Sanders (PI), P. Kraft (Co-PI), D. Cornea-Hasegan (Co-PI)
2. Ministry of Science and Innovation (Spain)  
Title: Interpretation and Characterization of Complexity Analysis Techniques in the Context of Biomedical Signal Processing (2008)  
Amount: \$17,872.20 for Phase I  
M Aboy (Co-PI), D Cuesta (Co-PI)
3. RFC & EFF Grants. OIT Internal Funding  
Title: RFC/EFF - Electrical Engineering & Renewable Energy Laboratory Development and Equipment (2008/9)  
Amount: \$124,566, M Aboy (Co-PI), B Bass (Co-PI), C Crespo (Co-PI), J Zipay (Co-PI)
4. Ministry of Industry & Commerce R&D Grant (Spain)  
Title: Development of a Novel ABPM Monitor (2007)  
Amount: \$21,220 for Phase I  
M Aboy (Co-PI), D Cuesta (Co-PI)
5. Generalitat Valenciana (Spain)  
Title: Development of a Novel Multipurpose Noninvasive Medical Monitor-Biomult (2007)  
Amount: \$43,526, M Aboy (Co-PI), D Cuesta (Co-PI)
6. Intel Faculty Fellowship Grant  
Title: Modular Curriculum in Electronics & Renewable Energy Engineering for Increased Access to Undergraduate Education in Oregon (2006/07 Academic Year)  
Amount: \$40,000, M Aboy (PI)
7. RFC Grant. OIT Internal Funding  
Title: RFC - Laboratory Equipment for EERE PDX (2007/8 Academic Year)  
Amount: \$21,000, M Aboy (Co-PI), B. Bass (Co-PI)
8. Tektronix Donation  
Title: Electronics Lab Equipment Donation (2006/07 Academic Year)  
Amount: \$20,000, M Aboy (PI)
9. RFC Grant. OIT Internal Funding  
Title: Laboratory Development & Equipment. Electronics & Physics (2006/7 Academic Year)  
Amount: \$27,000, M Aboy (PI)
10. RFC Grant. OIT Internal Funding  
Title: Electronics Laboratory Development & Equipment (2005/6 Academic Year)  
Amount: \$6,000, M Aboy (PI) , R. Bass (Co-PI)
11. RFC Grant. OIT Internal Funding  
Title: Electronics Laboratory Development & Equipment (2004/5 Academic Year)  
Amount: \$13,000, M Aboy (PI)
12. Intel Curriculum Fellowship Grant  
Title: Development of Web-Based Electronics Laboratories with Real Instruments  
Amount: \$40,000 G Guran (PI), D Pocok (Co-PI), M Aboy (Co-PI/Developer)
13. Thrasher Research Fund  
Title: Modeling intracranial pressure dynamics in pediatric traumatic brain injury (10/1/03-9/30/06)  
Amount: \$319,882 , B Goldstein (PI), J McNames (Co-PI), W Wakeland (Co-PI), M Aboy (Researcher)

14. Friends of Doernbecher Foundation  
Title: Physiologic state characterization in pediatric septic shock (9/1/03-6/30/03)  
Amount: \$23,000, B Goldstein (PI), McNames (Co-Pi), M Aboy (Researcher)
15. Northwest Health Foundation  
Title: Severe Traumatic Brain Injury in Children: Predicting the Future (1/1/01-10/1/03)  
Amount: \$87,140, G Goldstein (PI), M Ellenby (Co-PI), R Sciabassi (Co-PI), J McNames (Co-PI), M Aboy (Researcher)