

# Richard J. Povinelli, Ph.D., P.E. – Curriculum Vitae

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## **Summary**

### **Awards and Honors**

- PhysioNet/Computers in Cardiology Challenge 2007 – Winning Entry
- PhysioNet/Computers in Cardiology Challenge 2005 – Award Winning Paper
- Engineers and Scientists of Milwaukee – Young Engineer of the Year Award, 2003
- IEEE Senior Member, 2001 – present

### **Teaching**

- 14 different courses taught
- 9 new courses developed

### **Research**

#### **Publications (64 refereed publications)**

- 14 refereed journals published
- 2 prize paper awards
- 1 invited book review
- 5 selective refereed conference proceedings published
- 42 refereed conferences/workshop proceedings published

#### **External Grants (\$1,168,395 in total external funding)**

- 4 major National Science Foundation grants (1 as PI, 1 as co-PI, 2 as faculty associate)
- 1 American Heart Association (AHA) Fellowship (sponsor for PhD student)
- 6 NSF Research Experiences for Undergraduate (REU) supplements

#### **Graduate Student Advising**

- 2 Ph.D. graduates
- 1 Ph.D. candidate
- 6 M.S. graduates
- 3 Ph.D. students currently
- 1 M.S. student currently
- 5 PhD, 20 M.S. committee memberships (3 current – 3 PhD)

### **Service**

#### **Service within Marquette**

- Director of Computer Engineering Laboratories for Department of Electrical and Computer Engineering
- Charter Faculty Sponsor for the Marquette University Student Chapter of Association of Computing Machinery (ACM)
- Charter Faculty Sponsor for the Marquette University Chapter of Upsilon Pi Epsilon (UPE)
- 13 committee memberships

#### **Service outside Marquette**

- Reviewer for 21 conferences, journals, agencies, and professional organizations
- 2 conference organizing committees
- 3 conference session chairs

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## **Education**

- 1997 - 1999      Ph.D. Electrical and Computer Engineering  
Marquette University, Milwaukee, WI
- 1987 - 1989      M.S. Computer and Systems Engineering  
Rensselaer Polytechnic Institute, Troy, NY
- 1983 - 1987      B.S. Electrical Engineering (Honors Graduate)  
B.A. Psychology (Magna Cum Laude)  
University of Illinois, Champaign-Urbana, IL
- 1984 - 1985      Junior Year Abroad  
University of Munich, Munich, West Germany

## **Academic, Scholarly, and Industrial Experience**

- 2006 – present    Associate Professor of Electrical and Computer Engineering and  
Director of Computer Engineering Laboratories  
Marquette University, Milwaukee, Wisconsin
- 1999 – 2006      Assistant Professor of Electrical and Computer Engineering and  
Director of Computer Engineering Laboratories  
Marquette University, Milwaukee, Wisconsin
- 1998 - 1999      Adjunct Assistant Professor of Electrical and Computer Engineering and  
Director of Computer Engineering Laboratories  
Marquette University, Milwaukee, WI
- 1995 - 1998      Lecturer, Electrical and Computer Engineering Department  
Marquette University, Milwaukee, WI
- 1995 - 1996      Lecturer, Management Department  
Marquette University, Milwaukee, WI
- 1995 - 1998      Instructor, Master of Arts in Teaching Program  
Aurora University, New Berlin, WI
- 1998              Instructor, Computer Information Systems  
Milwaukee Area Technical College, Milwaukee, WI
- 1992 - 1994      Global Project Leader  
GE Medical Systems, Milwaukee, WI
- 1990 - 1992      Program Manager  
GE Medical Systems, Milwaukee, WI
- 1987 - 1990      Software Engineer  
GE Corporate Research and Development, Schenectady, NY

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## **Awards and Honors**

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Engineers and Scientists of Milwaukee – Young Engineer of the Year Award, 2003

IEEE Senior Member, 2001 – present

Professional Engineer License (Wisconsin), 2003 – present

Recipient of the following General Electric Management Awards

6 Step Problem Solving Trainer, 1994

Field Laptop/CD-ROM Project Leader, 1992

Successful Service Communication Broadcast, 1992

## ***Professional Affiliations***

Institute of Electrical and Electronics Engineers (IEEE), 1985 – 1987 (student member), 1997 – 2001 (member), and 2001 – present (senior member)

IEEE Computer Society, 1999 - 2007

Association for Computing Machinery (ACM), 1999 – present

ACM – Special Interest Group Knowledge Discovery in Data (SIGKDD), 1999 – 2007

American Society for Engineering Education (ASEE), 2000 – 2007

## ***Honorary Societies***

Tau Beta Pi, 1985 – present

Phi Beta Kappa, 1985 – present

Golden Key, 1985 – present

Eta Kappa Nu, 1985 – present

Sigma Xi, 1999 – present

Upsilon Pi Epsilon, 2001 – present

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## Teaching

### **Teaching Philosophy**

Four core ideas form my teaching philosophy: excellence, compassion, interaction, and application.

#### Excellence

- One of the core values of Marquette University is *magis*, meaning to always strive for more; to strive for excellence. It embodies the ideas of high expectations, integrity, and continuous improvement. For me, magis means always learning, improving, and searching for new ways to help students learn. It means always considering the ethical and moral dimension of any action. For my students it means an expectation of success. They will be expected to work hard. They will be expected to hold themselves to the highest ethical standards. It also means that I will strive to give my students the tools that they need to succeed including the support necessary to meet these high standards.

#### Compassion

- Another core Marquette value is *cura personalis* or care for the whole person; the embodiment of compassion. This concept balances the striving for excellence by remembering that a student is first and foremost a human being. For me, compassion means taking the time to really know my students, to be willing to explain concepts as many times and in as many different ways as it takes, and understanding that my students have many conflicting demands on their time.

#### Interaction

- I have always enjoyed teaching classes where the students actively participate. A conversation is more fun than a monologue. I strive to make my teaching motivating, exciting, and interactive. I view learning as an interactive and participatory process. Students learn best when self-motivated, and I try to tap into that self-motivation.

#### Application

- The fourth core idea comes from my industrial experience as an engineer and manager. Learning should be practical, real world focused, and life-long. I know what is expected of an engineer working in industry. I want my students to succeed beyond my classroom and Marquette University as they apply what they have learned in my courses in their future studies and careers.

### **Major Courses Developed**

- Introduction to Intelligent Systems (COEN 130)
  - Taught Fall 2006, Fall 2008
  - Course website: <http://povinelli.eece.mu.edu/teaching/coen130/>
  - Designed an undergraduate level introduction to the field of artificial intelligence.
- Artificial Intelligence (EECE 216)
  - Taught Fall 2001, Fall 2003, Fall 2005
  - Course website: <http://povinelli.eece.mu.edu/teaching/eece216/>
  - Designed a graduate level introduction to the field of artificial intelligence as the initial course for a graduate curriculum in this area.
- Chaos and Nonlinear Signal Processing (EECE 221)
  - Formerly Time Series, Data Mining, and Chaos (EECE 229)
  - Taught Fall 2000, Spring 2002, Spring 2004
  - Course website: <http://povinelli.eece.mu.edu/teaching/eece221/>
  - Designed a research oriented graduate course with a focus on building the skills to complete an independent original research project in the area of nonlinear signal processing. The pedagogical tools used included article reviews (including summaries and critiques), anonymous peer reviews of others student's work, and a mini-conference at the end of the course. Students have published 11 conference papers out of 18 written for this course.
- Computer Hardware Laboratory (COEN 140)
  - Taught Fall 1999, 2000, 2001, 2002, 2003
  - Course website: <http://povinelli.eece.mu.edu/teaching/coen140old/>

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- Designed a senior level laboratory course for computer engineering students. Developed a three-stage course design. The first stage introduces the students to the necessary technical content: VHDL, Xilinx, FPGAs. The second stage begins a team based project of their choosing that is based on computer hardware technology introduced during the first phase. The last phase is used to complete the project. To help motivate and to avoid overwhelming the students with the potential complexity of the technological content of the course, the project is split into two stages to give students a chance to re-estimate and re-scale the complexity of their projects.
- Embedded Systems Design (COEN 140)
  - Taught Fall 2004, 2005, 2006, 2008
  - Course website: <http://povinelli.eece.mu.edu/teaching/coen140/>
  - Designed a senior level embedded systems course, which shows embedded systems development at the hardware level using FPGA technology and at the portable device level using a PDA platform.
- Evolutionary Computation (COEN 133 / COEN 168)
  - Taught Spring 2001, 2002, 2009
  - Course website: <http://povinelli.eece.mu.edu/teaching/coen133/>
  - Designed an upper level undergraduate / graduate course to introduce students to a sub-field of artificial intelligence, namely evolutionary computation. This course is part of an overall effort to develop a comprehensive graduate artificial intelligence curriculum.
- Global Project Management (BUAD 279)
  - Taught Spring 1995, 1996
  - Designed a project management course based on my experience as a global project manager. The pedagogical tools used included learning contracts, real world case studies, industrial projects with global characteristics, and guest lecturers with international experience.
- Introduction to Computer Programming (GEEN 051)
  - Taught Spring 2000, 2001
  - Course website: <http://povinelli.eece.mu.edu/teaching/coen051/>
  - Designed a freshman engineering introduction to computer programming course that introduces the use of object orient programming. The pedagogical focus was on learning by doing supplemented with a discussion session laboratory conducted by upper classmen.
- Machine Learning (EECE 229)
  - Taught Spring 2003, 2005, 2007
  - Course website: <http://povinelli.eece.mu.edu/teaching/eece229ml/>
  - Designed a graduate level machine learning course to continue the development of the graduate artificial intelligence curriculum.

## **Other Major Courses Taught**

- Computer Hardware (EECE 194 / COEN 171)
  - Taught Fall 1996, Spring 1997, Spring 2002, Spring 2003, Spring 2009
  - Course website: <http://povinelli.eece.mu.edu/teaching/coen171/>
- Digital Electronics Laboratory (EECE 143)
  - Taught Fall 1996, Spring 1997
  - Course website: <http://povinelli.eece.mu.edu/teaching/eece143/>
- Introduction to Computer Hardware and Software (EECE 190 / COEN 030)
  - Taught Fall 1997, Spring 1997, Summer 1998, Fall 1998, Spring 1999
  - Course website: <http://povinelli.eece.mu.edu/teaching/coen030/>
- Introduction to Software Engineering (Graduate level, EECE 211)
  - Taught Fall 1995
- Software Engineering (COEN 181)
  - Formerly Software Methodologies (EECE 194)
  - Taught Fall 1995, Spring 2004
  - Course website: <http://povinelli.eece.mu.edu/teaching/coen181/>

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## **Senior Design Advising**

- Cluster Computing Environment, 2000 – 2001
- Cluster Computing Environment (Top EECE Senior Design Team), 2001 – 2002
- Cluster Computing Environment, 2002 – 2003
- Computer Game (Top EECE Senior Design Team), 2003 – 2004
- Reconfigurable Electric Motor, 2004 – 2005
- Financial Engineering - Hedge Fund Trading System, 2006 – 2007
- Customizable Action Figures, 2008-2009

## **Research**

### **Journal Publications and In Press (Refereed)**

1. Chia-Chou Yeh, G. Y. Sizov, Ahmed Sayed-Ahmed, Nabeel A. O. Demerdash, **Richard J. Povinelli**, Edwin E. Yaz, Daniel M. Ionel. (2008) "A Reconfigurable Motor for Experimental Emulation of Stator Winding Interturn and Broken Bar Faults in Polyphase Induction Machines," IEEE Transaction on Energy Conversion, vol. 23, no. 4, December, 1005-1014.
2. Kevin M. Indrebo, **Richard J. Povinelli**, Michael T. Johnson. (2008) "Minimum Mean-Squared Error Estimation of Mel-Frequency Cepstral Coefficients Using a Novel Distortion Model," IEEE Transactions on Audio, Speech, and Language Processing, vol. 16, no. 8, November, 1654 – 1661.
3. Larry Smith, Lorraine K Tanabe, Rie Johnson nee Ando, Cheng-Ju Kuo, I-Fang Chung, Chun-Nan Hsu, Yu-Shi Lin, Roman Klinger, Christoph M Friedrich, Kuzman Ganchev, Manabu Torii, Hongfang Liu, Barry Haddow, Craig A Struble, **Richard J Povinelli**, Andreas Vlachos, William A Baumgartner Jr, Lawrence Hunter, Bob Carpenter, Richard Tzong-Han Tsai, Hong-Jie Dai, Feng Liu, Yifei Chen, Chengjie Sun, Sophia Katrenko, Pieter Adriaans, Christian Blaschke, Rafael Torres, Mariana Neves, Preslav Nakov, Anna Divoli, Manuel Maña-López, Jacinto Mata and W John Wilbur. (2008) "Overview of BioCreative II Gene Mention Recognition," Genome Biology, vol 9, no. 2, September, S2.1-19.
4. Aderiano M. da Silva, **Richard J. Povinelli**, Nabeel A. O. Demerdash. (2008) "Induction Machine Broken Bar and Stator Short-Circuit Fault Diagnostics Based on Three Phase Stator Current Envelopes," IEEE Transactions on Industrial Electronics, vol. 55, no. 3, March, 1310-1318.
5. Behrooz Mirafzal, **Richard J. Povinelli**, and Nabeel A. O. Demerdash. (2006) "Inter-Turn Fault Diagnosis in Induction Motors Using the Pendulous Oscillation Phenomenon," IEEE Transactions on Energy Conversion, vol. 21, no. 4, December, 871-882.
6. Peter S. Bazeley, Sridevi Prithivi, Craig A. Struble, **Richard J. Povinelli**, and Daniel S. Sem. (2006) "Synergistic use of compound properties and docking scores in neural network modeling of CYP2D6 binding: Predicting affinity and conformational sampling," Journal of Chemical Information and Modeling, vol. 46, 2698-2708.
7. Kevin M. Indrebo, **Richard J. Povinelli**, Michael T. Johnson. (2006) "Sub-banded Reconstructed Phase Spaces for Speech Recognition," Speech Communication, vol. 48, 760-774.
8. **Richard J. Povinelli**, Michael T. Johnson, Andrew C. Lindgren, Felice M. Roberts, Jinjin Ye. (2006) "Statistical Models of Reconstructed Phase Spaces for Signal Classification," IEEE Transactions on Signal Processing, vol. 54, no. 6, June, 2178-2186.
9. Michael T. Johnson, **Richard J. Povinelli**, Andrew C. Lindgren, Jinjin Ye, Xiaolin Liu, Kevin M. Indrebo. (2005) "Time-Domain Isolated Phoneme Classification using Reconstructed Phase Spaces," IEEE Transactions on Speech and Audio Processing, vol. 13, no. 4, July, 458-466.
10. Michael T. Johnson, **Richard J. Povinelli**. (2005) "Generalized Phase Space Projection for Nonlinear Noise Reduction," Physica D, vol. 201, no. 3-4, February, 306-317.
11. **Richard J. Povinelli**, Michael T. Johnson, Andrew C. Lindgren, Jinjin Ye. (2004) "Time Series Classification using Gaussian Mixture Models of Reconstructed Phase Spaces," IEEE Transactions on Knowledge and Data Engineering, vol. 16, no. 6, June, 779-783.
12. John F. Bangura, **Richard J. Povinelli**, Nabeel A.O. Demerdash, Ronald H. Brown (2003) "Diagnostics of Eccentricities and Bar/End-Ring Connector Breakages in Polyphase Induction Motors through a Combination of Time-Series Data Mining and Time-Stepping Coupled FE-State Space Techniques," IEEE Transactions On Industry Applications, vol. 39, no. 4, July/August, 1005-1013.

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13. **Richard J. Povinelli**, Xin Feng (2003) "A New Temporal Pattern Identification Method For Characterization And Prediction Of Complex Time Series Events," IEEE Transactions on Knowledge and Data Engineering, vol. 15, no. 2, March/April, 339-352.
14. **Richard J. Povinelli**, John F. Bangura, Nabeel A.O. Demerdash, Ronald H. Brown (2002) "Diagnostics of Bar and End-Ring Connector Breakage Faults in Polyphase Induction Motors Through a Novel Dual Track of Time-Series Data Mining and Time-Stepping Coupled FE-State Space Modeling," IEEE Transactions on Energy Conversion, vol. 17, no. 1, March 2002, 39-46.

## ***Prize Paper Awards***

15. Mohamed A. Mneimneh, **Richard J. Povinelli**. (2007) "RPS/GMM Approach toward the Localization of Myocardial Infarction," PhysioNet/Computers in Cardiology Challenge Winning Entry, Computers in Cardiology, Durham, North Carolina. 185-188.
16. **Richard J. Povinelli**. (2005) "Towards the Prediction of Transient ST Changes," PhysioNet/Computers in Cardiology Challenge Winning Paper, Computers in Cardiology, Leon, France.

## ***Invited Book Review***

17. **Richard J. Povinelli**. (2004) "A Review of 'Foundations of Genetic Programming' by William Langdon and Ricardo Poli, Springer Verlag", Genetic Programming and Evolvable Machines, vol. 5, no. 3, 319-320.

## ***Selective Conference Publications and In Press (Refereed)***

18. Michael T. Johnson, Andrew C. Lindgren, **Richard J. Povinelli**. (2004) "Joint Frequency Domain and Reconstructed Phase Space Features for Speech Recognition," International Conference on Acoustics, Speech and Signal Processing, Montreal, Canada, vol. I, 533-536. (1255/2556: 49% Acceptance Rate)
19. Michael T. Johnson, Andrew C. Lindgren, **Richard J. Povinelli**, Xiaolong Yuan. (2003) "Performance of Nonlinear Speech Enhancement using Phase Space Reconstruction," International Conference on Acoustics, Speech and Signal Processing 2003, Hong Kong, China, vol. I, 872-875. (1260/2377: 53% Acceptance Rate)
20. Andrew C. Lindgren, Michael T. Johnson, **Richard J. Povinelli**. (2003) "Speech Recognition using Reconstructed Phase Space Features," International Conference on Acoustics, Speech and Signal Processing 2003, Hong Kong, China, vol. I, 61-63. (1260/2377: 53% Acceptance Rate)
21. James B. Vitrano, **Richard J. Povinelli**. (2001) "Selecting Dimensions and Delay Values for a Time-Delay Embedding Using a Genetic Algorithm," Genetic and Evolutionary Computation Conference (GECCO2001), San Francisco, California, 1423-1430. (170/352: 48% Acceptance Rate)
22. Felice M. Roberts, **Richard J. Povinelli**, Kristina M. Ropella. (2001) "Identification of ECG Arrhythmias using Phase Space Reconstruction," 5th European Conference on Principles and Practice of Knowledge Discovery in Databases (PKDD'01), Freiburg, Germany, 411-423. (90/240: 38% Acceptance Rate)

## ***Conference Publications and In Press (Refereed)***

23. Mohamed A. Mneimneh, **Richard J. Povinelli**. (2008) "An Electrophysiological Cardiac Model Approach to Measuring T-Wave Alternans," Computers in Cardiology, Bologna, Italy, 613-616.
24. Mohamed A. Mneimneh, Michael T. Johnson, **Richard J. Povinelli**. (2008) "A Heart-Cell Model for the Identification of Myocardial Infarction," HEALTHINF 2008 International Conference on Health Informatics, Funchal, Madeira-Portugal, 51-58.
25. Craig A. Struble, **Richard J. Povinelli**, Michael T. Johnson, Dina Berchanskiy, Jidong Tao, Marek Trawicki. (2007) "Combined Conditional Random Fields and n-Gram Language Models for Gene Mention Recognition," BioCreative II, Madrid, Spain.

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26. Chia-Chou Yeh, Gennadi Y. Sizov, Ahmed Sayed-Ahmed, Nabeel A. O. Demerdash, **Richard J. Povinelli**, Edwin E. Yaz, Dan M. Ionel. (2007) "A Reconfigurable Motor for Experimental Emulation of Stator Winding Inter-Turn and Broken Bar Faults in Polyphase Induction Machines," IEEE International Electric Machines and Drives Conference (IEMDC2007), Antalya, Turkey, 3-5 May, 2007.
27. Mohamed A. Mneimneh, George F. Corliss, **Richard J. Povinelli**. (2007) "A Cardiac Electro-physiological Model Based Approach for Filtering High Frequency ECG Noise," Computers in Cardiology, Durham, North Carolina, 253-256.
28. Mohamed A. Mneimneh, **Richard J. Povinelli**. (2006) "Integrative Approach for the Measurement of the QT Interval," Computers in Cardiology, Valencia, Spain, 329-332.
29. **Richard J. Povinelli**, Mohamed A. Mneimneh, Michael T. Johnson. (2006) "Cardiac Model Based Approach to QT Estimation," Computers in Cardiology, Valencia, Spain, 333-336.
30. Mohamed A. Mneimneh, Edwin E. Yaz, Michael T. Johnson, **Richard J. Povinelli**. (2006) "An Adaptive Kalman Filter for Removing Baseline Wandering," Computers in Cardiology, Valencia, Spain, 253-256.
31. Anthony D. Ricke, **Richard J. Povinelli**. (2005) "Segmenting Heart Sound Signals," Computers in Cardiology, Leon, France, 953-956.
32. Chia Chou Yeh, Behrooz Mirafzal, **Richard J. Povinelli**, Nabeel A. O. Demerdash. (2005) "A Condition Monitoring Vector Database Approach for Broken Bar Fault Diagnostics of Induction Machines," IEEE International Electric Machines and Drives Conference (IEMDC2005), San Antonio, Texas, 29-34.
33. Kevin M. Indrebo, **Richard J. Povinelli**, Michael T. Johnson. (2005) "Third-Order Moments of Filtered Speech Signals For Robust Speech Recognition," International Conference on Non-Linear Speech Processing (NOLISP), Barcelona, Spain, 151-157.
34. Chia Chou Yeh, **Richard J. Povinelli**, Nabeel A. O. Demerdash. (2004) "Diagnostics of Stator Winding Inter-Turn and Power Conditioner Faults in Induction Machine Inverter-Fed Drive Systems Using Time-Series Data Mining Technique," IEEE International Conference on Power System Technology (Powercon2004), Singapore, TA6.1.
35. Behrooz Mirafzal, Fariba Fateh, Chia Chou Yeh, **Richard J. Povinelli**, and Nabeel A. O. Demerdash. (2004) "Condition Monitoring of Squirrel-Cage Induction Motors Fed by PWM-Based Drives Using a Parameter Estimation Approach," IEEE International Conference on Power System Technology (Powercon2004), Singapore, WD4.3.
36. Felice M. Roberts, **Richard J. Povinelli**. (2004) "A Statistical Feature Based Approach to Predicting Termination of Atrial Fibrillation," Computers in Cardiology, Chicago, Illinois, 673 - 676.
37. Michael W. Zimmerman, **Richard J. Povinelli**. (2004) "On Improving the Classification of Myocardial Ischemia Using Holter ECG Data," Computers in Cardiology, Chicago, Illinois, 377- 380.
38. Kevin M. Indrebo, **Richard J. Povinelli**, and Michael T. Johnson. (2004) "A Comparison of Reconstructed Phase Spaces and Cepstral Coefficients for Multi-Band Phoneme Classification," International Conference on Signal Processing (ICSP2004), Beijing, China, 630-633.
39. David H. Diggs, **Richard J. Povinelli**. (2003) "A Temporal Pattern Approach for Predicting Weekly Financial Time Series," Artificial Neural Networks in Engineering, St. Louis, Missouri, 707-712.
40. Michele R. B. Malinowski, **Richard J. Povinelli**. (2003) "Searching for Non-Sense: Identification of Pacemaker Non-Sense and Non-Capture Failures using Machine Learning Techniques" Computers in Cardiology, Thessaloniki, Greece, 53-56.
41. Felice M. Roberts, **Richard J. Povinelli**, Kristina M. Ropella. (2003) "Rhythm Classification Using Reconstructed Phase Space Of Signal Frequency Subbands," Computers in Cardiology, Thessaloniki, Greece, 61-64.
42. Michael W. Zimmerman, **Richard J. Povinelli**, Michael T. Johnson, Kristina M. Ropella. (2003) "A Reconstructed Phase Space Approach for Distinguishing Ischemic from Non-Ischemic ST Changes using Holter ECG Data," Computers in Cardiology, Thessaloniki, Greece, 243-246.
43. Kevin M. Indrebo, **Richard J. Povinelli**, Michael T. Johnson. (2003) "A Combined Sub-band and Reconstructed Phase Space Approach to Phoneme Classification," ISCA Tutorial and Research Workshop on Non-linear Speech Processing (NOLISP), Le Croisic, France, 107-110.
44. Xiaolin Liu, **Richard J. Povinelli**, Michael T. Johnson. (2003) "Vowel Classification by Global Dynamic Modeling," ISCA Tutorial and Research Workshop on Non-linear Speech Processing (NOLISP), Le Croisic, France, 111-114.

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45. Jinjin Ye, Michael T. Johnson, **Richard J. Povinelli**. (2003) "Study of Attractor Variation in the Reconstructed Phase Space of Speech Signals," ISCA Tutorial and Research Workshop on Non-linear Speech Processing (NOLISP), Le Croisic, France, 5-10.
46. Jinjin Ye, Michael T. Johnson, **Richard J. Povinelli**. (2003) "Phoneme Classification over Reconstructed Phase Space using Principal Component Analysis," ISCA Tutorial and Research Workshop on Non-linear Speech Processing (NOLISP), Le Croisic, France, 11-16.
47. **Richard J. Povinelli**, Michael T. Johnson, John F. Bangura, Nabeel A.O. Demerdash. (2002) "A Comparison of Phase Space Reconstruction and Spectral Coherence Approaches for Diagnostics of Bar and End-Ring Connector Breakage and Eccentricity Faults in Polyphase Induction Motors using Current Waveforms," Conference Record of the 2002 IEEE Industry Applications Conference/ 37th IAS Annual Meeting, Pittsburgh, Pennsylvania, 1541-1547.
48. Xiaolin Liu, **Richard J. Povinelli**, Michael T. Johnson. (2002) "Detecting Determinism in Speech Phonemes," IEEE Digital Signal Processing Workshop 2002, Pine Mountain, Georgia, 2.3.
49. Jinjin Ye, **Richard J. Povinelli**, Michael T. Johnson. (2002) "Phoneme Classification Using Naïve Bayes Classifier in Reconstructed Phase Space," IEEE Digital Signal Processing Workshop 2002, Pine Mountain, Georgia, 2.2.
50. **Richard J. Povinelli**, Felice M. Roberts, Kristina M. Ropella, Michael T. Johnson. (2002) "Are Nonlinear Ventricular Arrhythmia Characteristics Lost, As Signal Duration Decreases?" Computers in Cardiology, Memphis, Tennessee, 221-224.
51. Minglei Duan, **Richard J. Povinelli**. (2001) "Nonlinear modeling: Genetic Programming vs. Fast Evolutionary Programming," Artificial Neural Networks in Engineering, St. Louis, Missouri, 171-176.
52. Minglei Duan, **Richard J. Povinelli**. (2001) "Predictability of Stock Price Time Series," Artificial Neural Networks in Engineering, St. Louis, Missouri, 215-220.
53. Patrick Clemins, **Richard J. Povinelli**. (2001) "Detecting Regimes in Temperature Time Series," Artificial Neural Networks in Engineering, St. Louis, Missouri, 727-732.
54. John F. Bangura, **Richard J. Povinelli**, Nabeel A.O. Demerdash, Ronald H. Brown. (2001) "Diagnostics of Eccentricities and Bar/End-Ring Connector Breakages in Polyphase Induction Motors through a Combination of Time-Series Data Mining and Time-Stepping Coupled FE-State Space Techniques," Conference Record of the 2001 IEEE Industry Applications Conference/ 36th IAS Annual Meeting, Chicago, Illinois, 1579-1586.
55. Minglei Duan, **Richard J. Povinelli**. (2001) "Estimating Stock Price Predictability Using Genetic Programming," Genetic and Evolutionary Computation Conference (GECCO2001), San Francisco, California, 174.
56. **Richard J. Povinelli**, John F. Bangura, Nabeel A.O. Demerdash, Ronald H. Brown. (2001) "Diagnostics of Bar and End-Ring Connector Breakage Faults in Polyphase Induction Motors Through a Novel Dual Track of Time-Series Data Mining and Time-Stepping Coupled FE-State Space Modeling," IEEE International Electric Machines and Drives Conference (IEMDC2001), Boston, Massachusetts, 809-813.
57. **Richard J. Povinelli**, John F. Bangura, Nabeel A.O. Demerdash, Ronald H. Brown. (2000) "Diagnostics of Faults in Induction Motor ASDs Using Time-Stepping Coupled Finite Element State-Space and Time Series Data Mining Techniques," Third Naval Symposium on Electric Machines (EM2000), Philadelphia, Pennsylvania.
58. **Richard J. Povinelli**. (2000) "Comparing Genetic Algorithms Computational Performance Improvement Techniques," Artificial Neural Networks in Engineering, St. Louis, Missouri, 305-310.
59. **Richard J. Povinelli**, Xin Feng. (2000) "Characterization And Prediction Of Welding Droplet Release Using Time Series Data Mining," Artificial Neural Networks in Engineering, St. Louis, Missouri, 857-862.
60. **Richard J. Povinelli**. (2000) "Identifying Temporal Patterns for Characterization and Prediction of Financial Time Series Events," Temporal, Spatial, and Spatio-Temporal Data Mining: First International Workshop; revised papers (TSDM2000), Leon, France, 46-61.
61. **Richard J. Povinelli**. (2000) "Using Genetic Algorithms to Find Temporal Patterns Indicative of Time Series Events," GECCO 2000 Workshop: Data Mining with Evolutionary Algorithms, Las Vegas, Nevada, 80-84.
62. **Richard J. Povinelli**, Xin Feng. (1999) "Improving Genetic Algorithms Performance By Hashing Fitness Values" Artificial Neural Networks in Engineering, St. Louis, Missouri, 399-404.

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63. **Richard J. Povinelli**, Xin Feng. (1999) "Data Mining of Multiple Nonstationary Time Series," Artificial Neural Networks in Engineering, St. Louis, Missouri, 511-516.
64. **Richard J. Povinelli**, Xin Feng. (1998) "Temporal Pattern Identification of Time Series Data using Pattern Wavelets and Genetic Algorithms," Artificial Neural Networks in Engineering, St. Louis, Missouri, 691-696. (before assuming tenure track position)

## ***Conference Publications (Non-Refereed)***

65. **Richard J. Povinelli**. (2000) "Improving Computational Performance of Genetic Algorithms: A Comparison of Techniques" Genetic and Evolutionary Computation Conference Late Breaking Papers (GECCO2000), Las Vegas, Nevada, 297-302.

## ***Patents***

- US Patent 7,308,301 -- Method and apparatus for detecting a cardiac arrhythmia. Inventors: **Richard J. Povinelli**, Felice M. Roberts, Jack E. Lohman.

## ***Student Ph.D. Dissertations***

- Kevin M. Indrebo (2008) "Estimation of Cepstral Coefficients for Robust Speech Recognition," Ph.D. Dissertation, Marquette University.
- Mohamed A. Mneimneh (2008) "An Electrophysiological Cardiac Model with Applications to Ischemia Detection and Infarction Localization," Ph.D. Dissertation, Marquette University.

## ***Student M.S. Theses***

- Aderiano M. da Silva (2006) "Induction Motor Fault Diagnostic and Monitoring Methods," M.S. Thesis, Marquette University.
- David H. Diggs (2004) "Multiple Step Financial Time Series Prediction with Portfolio Optimization," M.S. Thesis, Marquette University.
- Michael W. Zimmerman (2004) "Classification of ECG ST Events as Ischemic or Non-Ischemic Using Reconstructed Phase Spaces," M.S. Thesis, Marquette University.
- Kevin M. Indrebo (2004) "Sub-banded Reconstructed Phase Spaces for Speech Recognition," M.S. Thesis, Marquette University.
- Michele R. B. Malinowski (2003) "Searching for Non-Sense: Identification of Pacemaker Non-Sense and Non-Capture Failures Using Machine Learning Techniques," M.S. Thesis, Marquette University.
- Minglei Duan (2002) "Time Series Predictability," M.S. Thesis, Marquette University.

## ***Presentations (invited)***

- **Richard J. Povinelli**. (2007) "Prediction and Signal Classification using Reconstructed Phase Spaces," presented at Universität Ulm, Ulm, Germany.
- **Richard J. Povinelli**. (2005) "Signal Classification using Statistical Models of Reconstructed Phase Spaces," presented at Electrical and Computer Engineering Colloquium, Marquette University, Milwaukee, Wisconsin.
- **Richard J. Povinelli**. (2004) "Signal Classification using Reconstructed Phase Spaces," presented at National Association of Engineering Student Councils Conference, Milwaukee, Wisconsin.
- **Richard J. Povinelli**. (2003) "Signal Classification using Reconstructed Phase Spaces – A Machine Learning Approach," presented at University of Wisconsin – Milwaukee Computer Science Seminar, Milwaukee, Wisconsin.
- Michael T. Johnson, **Richard J. Povinelli**. (2002) "Integrating Stochastic and Dynamical Methods for Speech Technology," presented at Electrical and Computer Engineering Colloquium, Marquette University, Milwaukee, Wisconsin.

# Richard J. Povinelli, Ph.D., P.E. – Curriculum Vitae

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- **Richard J. Povinelli**, Michael T. Johnson, Nabeel A.O. Demerdash, and Edwin E. Yaz. (2002) "Predictive Maintenance Technologies," presented at Center for Intelligent Maintenance Systems (IMS), University of Wisconsin - Milwaukee, Milwaukee, Wisconsin.
- **Richard J. Povinelli**, Michael T. Johnson, Nabeel A.O. Demerdash, and Edwin E. Yaz. (2002) "Diagnostics of AC Motors," presented at University Wisconsin - Madison, Madison, WI, May 2002.
- **Richard J. Povinelli**, Michael T. Johnson, Nabeel A.O. Demerdash, and Edwin E. Yaz. (2002) "Diagnostics of Induction Motors," presented at Rockwell International, Mequon, Wisconsin.
- **Richard J. Povinelli**, (2001) "Data Mining Temporal Structures for the Classification of Heart Arrhythmias," presented at Biostatistics Seminar, Medical College of Wisconsin, Milwaukee, Wisconsin.
- **Richard J. Povinelli** and Everton Walters. (2000) "Genetic Algorithms and Their Applications," presented at Electrical and Computer Engineering Colloquium, Marquette University, Milwaukee, Wisconsin.
- **Richard J. Povinelli**. (2000) "Who Wants to be a Millionaire? Data Mining Financial Time Series," presented at Electrical and Computer Engineering Colloquium, Marquette University, Milwaukee, Wisconsin.
- **Richard J. Povinelli**. (1999) "Time Series Data Mining: Identifying Temporal Patterns for Characterization and Prediction of Time Series Events," presented at Physics First Thursday Seminar Series, Marquette University, Milwaukee, Wisconsin.

## **Research Grants and Contracts Funded**

- \$154,395 "Acquisition of Linux Cluster to Support College-Wide Research and Teaching Activities," (2004) National Science Foundation, with PI: S. Scott Goldsborough and co-PI: John Borg. (September 2005 – August 2006) (I am listed as a faculty associate.)
- \$5,000 Way Klingler Summer Salary Award, Marquette University. (May – August 2005)
- \$210,000 "Acoustic waves in thin piezoelectric plates: theory and applications," National Science Foundation ECS-0401350. with PI: Shrinivas G. Joshi and co-PI: Dennis L. Polla (I am listed as a faculty associate.)
- \$358,000 "A Novel Approach to Fault Modeling, Diagnostics, and Prediction in Motor Drive Systems," National Science Foundation ECS-0322974. with co-PI: Nabeel A. O. Demerdash, (September, 2003 – August, 2006) Includes two Research Experiences for Undergraduates (REU) supplements - \$18,000.
- \$41,000 "Classifying and Predicting Atrial Arrhythmias Using Nonlinear Dynamical and Time Series Data Mining Techniques," American Heart Association. with PI: Felice M. Roberts and co-sponsor Kristina M. Ropella. (January 2003 – December 2004)
- \$3,000 "Constructing a Massive Heart Arrhythmia Database," Marquette University Regular Research Grant (January – June 2003)
- \$405,000 "Integration of Stochastic and Dynamical Methods for Speech Technology," National Science Foundation ITR-0113508. with PI: Michael T. Johnson, (September, 2001 – August, 2004) Includes three Research Experiences for Undergraduates (REU) supplements - \$45,000.
- \$2,500 "Preliminary Study of Motor Fault Diagnostic Methods," Marquette University Regular Research Grant (January – December 2001)
- \$12,000 Symantec Educational Software Grant of a site license for Visual Café 4.0. (1999)
- \$37,300 "Single License VHDL Software - Evaluation of VHDL in Computer Engineering Curriculum", VeriBest, Inc. (October, 1998)
- \$12,000 Symantec Educational Software Grant of a site license for Visual Café 3.0. (1998)

# Richard J. Povinelli, Ph.D., P.E. – Curriculum Vitae

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## **Graduate and Undergraduate Research Student Advising**

### ***Students (current)***

Regis P. DiGiacomo, Ph.D. student  
Felice Roberts, Ph.D. candidate  
Sean Leiba, Ph.D. student  
Zahid Uddin, M.S. student

### ***Students (graduated)***

Josh Peterson, B.S. 2009  
Kevin M. Indrebo, Ph.D. 2008  
Mohamed A. Mneimneh, Ph.D. 2008  
Aderiano M. da Silva, M.S. 2006  
Joseph G. Harman, B.S. 2006  
Daniel P. Ahern, B.S. 2005  
Lilia A. Brown, B.S. 2005  
F. Justin Evert, B.S. 2005  
Mark W. Schletty, B.S. 2005  
Timothy E. Stollendorf, B.S. 2005  
David H. Diggs, M.S. 2004  
Michael W. Zimmerman, M.S. 2004  
Kevin M. Indrebo, M.S. 2004  
Sarah Schmit, B.S. 2004  
Paul Hoffmann, B.S. 2003  
Michele R. B. Malinowski, M.S. 2003  
Minglei Duan, M.S. 2002  
Kevin M. Indrebo, B.S. 2002

### ***PhD/MS Graduates (Committee member)***

Kuntoro Audi – PhD 2008 (advisor: Dr. Michael T. Johnson)  
Li Xi – M.S. 2007 (advisor: Dr. Michael T. Johnson)  
Peter Szeto – M.S. 2007 (advisor: Dr. Xin Feng)  
Rohan Kennedy – M.S. 2006 (advisor: Dr. Ronald H. Brown)  
Anthony D. Ricke – M.S. 2006 (advisor: Dr. Michael T. Johnson)  
Sridevi Prithivi – M.S. 2006 (advisor: Dr. Daniel S. Sem)  
Abiman Pasachhe – M.S. 2006 (advisor: Dr. Shrinivas G. Joshi)  
Peter Bazeley – M.S. 2005 (advisor: Dr. Daniel S. Sem)  
Behrooz Mirfzal – PhD 2005 (advisor: Dr. Nabeel A. O. Demerdash)  
Patrick Clemins – PhD 2005 (advisor: Dr. Michael T. Johnson)  
Jill Gilbert – M.S. 2005 (advisor : Dr. George F. Corliss)  
Zhonghui Li - PhD 2005 (advisor: Dr. Fabien J. Josse)  
Ahmed Sesay – M.S. 2004 (advisor: Dr. Nabeel A. O. Demerdash)  
Susanto Halim – M.S. 2004 (advisor: Dr. Ronald H. Brown)  
Hong Yan – PhD 2004 (advisor: Dr. Martin A. Seitz)  
Hao Jiang – M.S. 2004 (advisor: Dr. Xin Feng)  
Mark Solverson – M.S. 2004 (advisor: Nabeel A. O. Demerdash)  
Jinjin Ye – M.S. 2004 (advisor: Dr. Michael T. Johnson)  
Franck Hounkpevi – M.S. 2003 (advisor: Dr. Michael T. Johnson)  
Andrew C. Lindgren – M.S. 2003 (advisor: Dr. Michael T. Johnson)  
Ester Lim – M.S. 2002 (advisor: Dr. Ronald H. Brown)  
ChiaChou Ye – M.S. 2002 (advisor: Nabeel A. O. Demerdash)  
Xiang Fu – M.S. 2001 (advisor: Dr. Xin Feng)  
Hai Huang – M.S. 2001 (advisor: Dr. Xin Feng)  
Felice M. Roberts – M.S. 2000 (advisor: Dr. James Heinen)

# Richard J. Povinelli, Ph.D., P.E. – Curriculum Vitae

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## **Current Committee Memberships**

Marik Trawiki – PhD (advisor: Dr. Michael T. Johnson)  
Jidong Tao – PhD (advisor: Dr. Michael T. Johnson)  
Ren Yao – PhD (advisor: Dr. Michael T. Johnson)

## **Graduate Advisors**

Ph.D. Advisor: Xin Feng, Marquette University  
M.S. Advisor: Piero Bonnisone, GE CRD/ Rensselaer Polytechnic Institute

## **Service**

- Reviewer for:
  - Signal Processing, 2008
  - IEEE Transactions on Signal Processing, 2008
  - Neurocomputing, 2007
  - IEEE Transactions on Evolutionary Computation, 2002, 2003, 2007
  - Data Mining and Knowledge Discovery Journal, 2005, 2006
  - IEEE International Midwest Symposium on Circuits and Systems, 2005
  - IEEE Transactions on Biomedical Engineering, 2005
  - IEEE Transactions on Speech and Audio Processing, 2004, 2005
  - IEEE Transactions on Industrial Applications, 2003, 2005
  - IEEE Transactions on Pattern Analysis and Machine Intelligence, 2004
  - International Journal of General Systems – Intelligent System Design, 2003, 2004
  - International Journal of Systems Science, 2004
  - Data & Knowledge Engineering (DKE) Journal, 2004
  - National Science Foundation, 2003, 2004
  - IEEE Sensors Journal, 2002, 2004
  - IEEE International Electric Machines and Drives Conference, 2003, 2004
  - Artificial Neural Networks in Engineering (ANNIE) Conference, 2000 – 2003
  - International Conference on Machine Learning, 2003
  - IEEE Admission and Advancement Committee, 2003
  - SIAM International Conference on Data Mining (SDM2004), 2003
  - American Control Conference, 2002
  - IEEE Transactions on Knowledge and Data Engineering, 2000, 2001
- Conference Organizing and Program Committees
  - Organizing Committee Artificial Neural Networks in Engineering Conference, 2000 – present
  - Program Committee International Conference on Machine Learning, 2003
- Conference Session Chairs
  - Session chair at Artificial Neural Networks in Engineering, 2001, 2003.
  - Session chair at International Workshop on Temporal, Spatial and Spatio-Temporal Data Mining, 2000.
- Science Fair Judge for St. Robert's Elementary School, 2005, 2006
- Guest Science Teacher for St. Robert's 1<sup>st</sup> Grade Science Fair Project, 2005
- Presenter at St. Robert's Elementary School High Interest Day , 2003 – 2005
- Presenter at National Association of Engineering Student Councils Conference, 2004
- Participated in IEEE Senior Member Promotion Review Panel, 2003
- Participated in Nathan Hale High School Career Day presenter, 1999

## **University Activities**

- Subcommittee on Faculty Welfare, 2006 – 2007
- Charter Faculty Sponsor for the Marquette University Student Chapter of Association of Computing Machinery (ACM), 2001 – present
- Charter Faculty Sponsor for the Marquette University Student Chapter of Upsilon Pi Epsilon (UPE – Computing Science Honor Society), 2001 – 2003

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## ***College Activities***

- Technology Committee, 2006 – present
- Building Committee, 2007 – 2008
- Biomedical Engineering Advisory Board, 2003 – present
- Greenheck Chair Search Committee, 2007
- Lead Electronic Technician Search Committee, 2006
- Engineering Core Curriculum Task Force, 2003 – 2004
- Computer System Engineer Search Committee, 2004
- Electrical and Computer Engineering Chair Search Committee, 2000 – 2001

## ***Department Activities***

- Director of Computer Engineering Laboratories for Department of Electrical and Computer Engineering, 1998 – present
  - Designed, implemented, and maintain Computer Engineering Laboratory
- Electrical and Computer Engineering Faculty Search Committee, 2005
- Graduate Committee, 1999 – present
- Laboratory Committee, 1998 – present
- Electrical and Computer Engineering Faculty Search Committee, 2005
- Awards Committee, 1999 – 2000, 2002 – 2004
- Goals Committee, 2001 – 2002
- Computer Software Coordination Committee, 1998 – 2000
- Webmaster for Department of Electrical and Computer Engineering 1999 – 2002
- Taught Hands on Mini Course for High School Seniors, 1999 - 2000

## ***Other Service***

- Cub Master, St. Robert Cub Scout Pack 15, Shorewood, Wisconsin, 2005, 2006
- Assistant Soccer Coach, Shorewood Kickers Soccer Club, Shorewood, Wisconsin, 2005, 2006
- Parish Council member, Saints Peter and Paul Church, Milwaukee, Wisconsin, 1997 – 2001
- Choir member, Saints Peter and Paul Church, Milwaukee, Wisconsin, 1996 – 1998
- Gentle-Man Program, Waukesha Women's Center, Waukesha, Wisconsin. Volunteered at shelter for abused woman and children. This volunteer program was honored with a JC Penny Golden Rule Award, 1990 – 1996
- Confirmation teacher, Saint John Neumann, Waukesha, Wisconsin, 1990 – 1992.
- 8th grade CCD teacher, Saint John the Evangelist, Schenectady, New York, 1987 – 1989

## ***Consulting Activities***

- Expert Witness for Quarles & Brady, Milwaukee, Wisconsin, 2004
- Expert Witness for Piaskoski & Associates, Milwaukee, Wisconsin, 2000 – 2001
- Patent Consultant for Barlitt, Beck, Herman, Palenchar & Scott, Chicago, IL., 1998.
- Technical Trainer for East Troy School District, East Troy, WI., 1997.