

Melani (Shoemaker) Plett

Department of Electrical Engineering
Seattle Pacific University
Seattle, Washington

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(1) Education

Undergraduate: B.S. Electrical Engineering 1991
Seattle Pacific University, Seattle, Washington

Graduate: M.S. Electrical Engineering 1993
University of Washington, Seattle, Washington

Ph.D. in Electrical Engineering 2000
University of Washington, Seattle, Washington
“Ultrasonic Arterial Vibrometry With Wavelet Based Detection and Estimation”

Coursework: Signal processing, electromagnetics and ultrasound 1996-1997
University of Washington, Seattle, Washington

Current Research: The role of a student’s connection to learning communities on his/her
engagement of the learning process
The role of engineering identity and vocation/calling in the workplace
persistence of engineers, especially women

(2) Academic and Professional Employment/Service

Teaching:

Professor 2012 - present
Department of Engineering and Computer Science
Seattle Pacific University
Seattle, Washington
Courses taught: Signals and Systems Analysis; Electric Circuits I, II III; USEM 1000;
Control Systems Design; Intro to Engineering, Intro to Bioengineering;
EGR 1010 The Way Things Work

Associate Professor 2006-2012
Department of Electrical Engineering
Seattle Pacific University
Seattle, Washington
Courses taught: Signals and Systems Analysis; Electric Circuits I, II III; USEM 1000;
Control Systems Design; Internship Preparation

Assistant Professor Spring 2000 – Summer 2006
Department of Electrical Engineering
Seattle Pacific University
Seattle, Washington
Courses taught: Signals and Systems Analysis; Electric Circuits I, II, III; USEM 1000;
Control Systems Design; Internship Preparation; Engineering Study Prep.

Curriculum Vitae

Instructor 1993 - 1996 (leave of absence Fall 1996 to Winter 2000)
Department of Electrical Engineering
Seattle Pacific University
Seattle, Washington
Courses taught: Signals and Systems Analysis; Electric Circuits I, II;
Computer Organization and Assembly Language

General Engineering Coordinator June 2012-June 2013
Department of Engineering and Computer Science
Seattle Pacific University
Seattle, Washington

Acting Department Chair January 2009 – June 2009
Department of Electrical Engineering
Seattle Pacific University
Seattle, Washington

Degree Coordinator:
Degree Coordinator of Engineering and Applied Sciences 2001 - 2007
Department of Electrical Engineering
Seattle Pacific University
Seattle, Washington

PhD committee member:
Caitlin Hawkinson Wasilewski, Organizational Psychology

Co-advisor:
Co-advisor to the SPU student branch of the IEEE, 2007-June 2014

Committee work at Seattle Pacific University:
The Erickson Conference on Undergraduate Research in Science, Technology,
Engineering and Math
Chair 2013 - present
Planning Committee 2002-2003, 2003-2004, 2010-present
Faculty Affairs Committee September 2012 – June 2015
First Year Curriculum Task Force 2013-14
Strategic Planning Task Force 2014
Assessment/Accreditation Committee June 2011 – April 2012
Admissions, Advising and Retention Committee Spring 2001 and 2006-2008
Intercollegiate Athletics Committee 1994-95, 1995-96
Search committee for the Director of Campus Ministries Winter 1995

Curriculum Vitae

Committee work beyond Seattle Pacific University:

Organizing committee member for the 2017 Christian Engineering Education Conference (CEC).

General Chair for the 2015 Christian Engineering Conference (CEC).

Web site manager and newsletter editor Christian Engineering Society 2011-2014

Organizing committee member for the 2013 Christian Engineering Education Conference (CEEC).

Organizing committee member for the 2011 Christian Engineering Education Conference (CEEC).

Affiliate member of IEEE's Signal Processing Society's Theory & Methods technical committee Fall 2010 – Fall 2011

Affiliate member of IEEE's Signal Processing Society's Signal Processing Education technical committee Fall 2010 – Fall 2011

Research:

Research Assistant 1996-2000

Department of Surgery

University of Washington, Seattle, Washington

-Worked with a team of researchers on a DARPA grant to detect and cease internal bleeding using diagnostic and high intensity ultrasound, respectively. My role was to detect bleeding from an artery if arterial vibrations were generated. The research entailed studies in ultrasound, non-stationary signal processing, and detection theory.

Faculty Researcher Summers 1994,1995

Phillips Laboratory (PL/LIMI)

United States Air Force

Kirtland Air Force Base, New Mexico

-Participated in the Air Force Office of Scientific Research Summer Faculty Research Program. Applied speckle imaging techniques to images taken of single stars collected by ground-based telescopes with the intent of mitigating the effects of blurring induced by the atmosphere.

Research Assistant 1992-1993

Electrical Engineering Biorobotics Lab

University of Washington, Seattle, Washington

-Developed a mathematical model of the mammalian alpha motoneuron and Renshaw Cell to study their combined effect of recurrent inhibition, which constitutes a basic block in mammalian muscle control.

-Designed, prototyped, and performed PCB layout and testing of an A/D, D/A I/O card to directly interface with a computer system based on TI's DSP 320C30 processor.

Workshops:

Attended the NSF funded Rigorous Research in Engineering Education workshop in Golden, Colorado, August 2010.

Curriculum Vitae

Grants:

Scott, E.P., Plett, M., Bolding, K., Peter, D., Lindberg, J. (2011-2016) “Engaging the Community to Achieve Success in Engineering II”, National Science Foundation, S-STEM: Scholarships in Science, Technology, Engineering and Math. (Award 1060082)

Plett, M., Scott, E., Peter, D. (2009-14) “Collaborative Research: Connection, Community, & Engagement in STEM Education”, National Science Foundation, Research & Evaluation on Education in Science Engineering. (This is a multi-university research project led by Denise Wilson, University of Washington, Awards 0909817, 0910143, 0909659, 0909900, and 0909850.)

Scott, E.P., Plett, M., Bolding, K., Peter, D., Lindberg, J. (2007-2013) “Engaging the Community to Achieve Success in Engineering (ECASE)”, National Science Foundation, S-STEM: Scholarships in Science, Technology, Engineering and Math. (Award 0728434)

Scott, E.P., Plett, M. (2009-13) “Collaborative Research: Professional Development Gateways in Social Learning Settings”, National Science Foundation, Transforming Undergraduate Education in Science, Technology, Engineering and Mathematics (formerly CCLI). (Award 0814802)

Plett, M. (2010-11), “Engineering identity, calling and the engineering workplace persistence of degreed Christian women engineers: a concept model and control groups”, SERVE faculty grant, Seattle Pacific University.

Plett, M. (2009-10) “Examining the role of engineering identity and faith in the engineering workplace persistence of degreed Christian women engineers,” Lilly Faculty Grant, Seattle Pacific University.

Plett, M., LaBrie, R., Peter, D., Gjerding, B., Scott, E., VanDuzer, J. (2007) “The Virtual Synchronous Classroom,” Seattle Pacific University Tech Grant.

Plett, M. (summer 2007), Academic Renewal Grant to develop voiced-over powerpoints on Circuits course topics for students who miss class.

Plett, M. (summer 2005), “Comparison and publication of dual depth ultrasonic vibration detection method”, Seattle Pacific University Faculty Research Grant.

(3) **Certification**
EIT (Engineer in Training), exam passed, #16609 Washington State, 1991

(4) **Publications**
DISSERTATION
M. Plett: Ultrasonic Arterial Vibrometry With Wavelet Based Detection and Estimation, Ph.D. Dissertation, University of Washington, Seattle, Washington, 2000.

MASTER’S THESIS

Curriculum Vitae

M. Shoemaker: A Study and Model of the Role of the Renshaw Cell in Regulating the Transient Firing Rate of the Motoneuron, M.S. Thesis, University of Washington, Seattle, Washington, 1993.

REFEREED JOURNAL PAPERS

Wilson, D., Jones, D., Kim, M.J., Allendoerfer, C., Bates, R., Crawford, J., Floyd-Smith, T., Plett, M., Veilleux, N. (2014), "The Link between Cocurricular Activities and Academic Engagement in Engineering Education", *J Engineering Education*, 103(4): 625-651.

Allendoerfer, C. Wilson, D., Crawford, J. Jones, D., Floyd-Smith, T., Plett, M. Scott, E. Veilleux, N., and Bates, R. (2012), "Strategic pathways for success: The influence of outside community on academic engagement." *J Engineering Education*, 101: 512-538.

M. Plett and D. Peter (2010), "Enabling remote learning and enhancing on-campus learning with web conferencing software", *Journal of Applications and Practices in Engineering Education*.

M. Plett (2007), "Transient Detection with the Cross Wavelet Transform and Wavelet Coherence" *IEEE Transactions on Signal Processing*, 55:1605-1611.

M. Plett and K. W. Beach (2005), "Ultrasonic Vibration Detection with Wavelets: Preliminary Results" *Ultrasound in Medicine and Biology*, 31:367-75.

M.I. Plett, K. W. Beach, B. Dunmire, K.G. Brown, J.F. Primozich, E. Strandness, Jr. (2001), "In Vivo Ultrasonic Measurement of Tissue Vibration at a Stenosis: A Case Study." *Ultrasound in Medicine and Biology*, 27:1049-1058.

Dunmire B., Beach K.W., Labs K-H, Plett M., Strandness D.E. Jr. (2000), "Cross-beam Vector Doppler Ultrasound for Angle-independent Velocity Measurements." *J Ultrasound in Medicine and Biology* 26: 1213-1235.

Martin R.W., Vaezy S., Kaczkowski P., Keilman G., Carter S., Caps M., Beach K., Plett M., Crum L., (1999), "Hemostasis of Punctured Vessels Using Doppler-Guided High-Intensity Ultrasound." *J Ultrasound in Medicine and Biology* 25: 985-990.

Beach K.W., Comess K.A., Primozich J.F., Yuan C., Powell K., Phillips D.J., Dunmire B., Plett M., Brown K., Paun M., Strandness D.E. Jr., et al. (1997), "Ultrasonic Color Flow Mapping: The Visualization of Four-dimensional Cardiac and Vascular Flow Phenomena Using Two Dimensions and 'Real Time'." *J Ultrasound in Medicine and Biology* 23: 347-363.

M. Shoemaker, B. Hannaford (1994) "A Study and Model of the Role of the Renshaw Cell in Regulating the Transient Firing Rate of the Motoneuron." *Biological Cybernetics* 71:251-262.

REFEREED CONFERENCE PROCEEDINGS PAPERS

Wilson, D.M., Allendoerfer, C., Bates, R., Floyd-Smith, T., Plett, M., & Veilleux, N. (2015). Go Team! The Role of the Study Group in Academic Success. Paper presented at the American Society of Engineering Education Conference, Seattle, Washington June 2015.

Curriculum Vitae

- Wilson, D.M., Jones, D., Bates, R., Floyd-Smith, T., Plett, M., & Veilleux, N. (2015). Sometimes Faculty Matter: The Contribution of Faculty Support to Future Engagement . Paper presented at the American Society of Engineering Education Conference, Seattle, Washington June 2015.
- Wilson, D.M., Allendoerfer, C., Bates, R., Floyd-Smith, T., Plett, M., & Veilleux, N. (2015). How Engineering Students Study: Alone, Together, or Start Alone, End Together. Paper presented at the American Society of Engineering Education Conference, Seattle, Washington June 2015.
- *Arvold, M., *Mow, S., *Cook, Z., *Goode, N., *Wasilewski, C., *Al-Hawaj, R., Plett, M. (2015). Teaching Teamwork: A Training Video Designed for Engineering Students. Paper presented at the American Society of Engineering Education Conference, Seattle, Washington June 2015.
(* student authors)
- *Wasilewski, C., Allendoerfer, C., Wilson, D., Bates, R., Floyd-Smith, T., Plett, M., & Veilleux, N. (2015). The Role of Faculty Support in Belonging and Engagement: Qualitative Studies. Paper presented at the American Educational Research Association (AERA) Annual Conference: Chicago, Illinois.
(* student author)
- Jones, D., Bocell, F.D., Wilson, D., Bates, R., Floyd-Smith, T., Plett, M., & Veilleux, N. (2015). The Role of Faculty Support in Belonging and Engagement: Quantitative Studies. Paper presented at the American Educational Research Association (AERA) Annual Conference: Chicago, Illinois.
- Wilson, D., Jones, D., Bates, R., Floyd-Smith, T., Plett, M., & Veilleux, N. (2015). The Role of Institutional Differences in Belonging and Engagement: Quantitative Studies. Paper presented at the American Educational Research Association (AERA) Annual Conference: Chicago, Illinois.
- Wilson, D., Allendoerfer, C., Bates, R., Floyd-Smith, T., Plett, M., & Veilleux, N. (2015). The Role of Institutional Differences in Belonging and Engagement: Qualitative Studies. Paper presented at the American Educational Research Association (AERA) Annual Conference: Chicago, Illinois.
- Allendoerfer, C., Wilson, D., Jones, D., Bates, R., Floyd-Smith, T., Plett, M., & Veilleux, N. (2015). The Role of Extracurricular Activities in Belonging and Engagement. Paper presented at the American Educational Research Association (AERA) Annual Conference: Chicago, Illinois.
- Jones, D., Wilson, D., Bates, R., Floyd-Smith, T., Plett, M., & Veilleux, N. (2015). Belonging and Academic Engagement. Paper presented at the American Educational Research Association (AERA) Annual Conference: Chicago, Illinois.
- Bates, R., Allendoerfer, C., Floyd-Smith, T., Veilleux, N., Plett, M., Wilson, D. (2015). Connections to Community: Using our Research in our Teaching Practice. Paper presented at the 6th Research in Engineering Education Symposium, Dublin, Ireland July 2015.

Curriculum Vitae

- *Wasilewski, C.H., Plett, M.I., Allendoerfer, C., Wilson, D., Bates, R., Floyd-Smith, T., Veilleux, N., & Carlson Jones, D. (2014). Student Perceptions of Faculty Influence on Educational Experience and Outcomes. Paper presented at the meeting of The Clute Institute Education Conference, San Francisco, CA August, 2014.
(* student author)
- Plett, M., Wilson, D., Bates, R.A., Allendoerfer, C., Jones, D.C., Floyd-Smith, T., Veilleux, N.M. and Wasilewski, C.H., "People Matter: The Role of Faculty and Peers in Students' Academic Engagement," ASEE 2014 Annual Conference and Exposition, Conference Proceedings.
- Wilson, D., Allendoerfer, C., Kim, M.J., Burpee, E., Bates, R., Floyd-Smith, T., Plett, M., Veilleux, N. "STEM Students outside the Classroom: The Role of the Institution in Defining Extracurricular Activity", ASEE 2013 Annual Conference and Exposition, Conference Proceedings.
- Bates, R., Martin, J.P., Wilson, D., Plett, M., Floyd-Smith, T. "Interactive Session: Measuring the Impact of Connection to Community", ASEE 2013 Annual Conference and Exposition, Conference Proceedings.
- Floyd-Smith, T., Wilson, D., Jones, D., Plett, M., Veilleux, N., Bates, R. "Understanding Belonging to Improve Persistence: A Gender Study," World Engineering Education Forum, Buenos Aires, Argentina, October 2012.
- Floyd Smith, T., Wilson, D., Jones, D., Plett, M., Bates, R., Veilleux, N., "Investigation of Belonging for Engineering and Science Undergraduates by Year in School", ASEE 2012 Annual Conference and Exposition, Conference Proceedings.
- Plett, M., Jones, D., Crawford, J., Floyd Smith, T., Peter, D., Scott, E., Wilson, D. Bates, R. Veilleux, N., "STEM Seniors: Strong Connections to Community Are Associated with Identity and Positive Affect in the Classroom," ASEE 2011 Annual Conference Proceedings.
- Plett, M., Hawkinson, C., VanAntwerp, J., Wilson, D., Bruxvoort, C., "Engineering Identity and the Workplace Persistence of Women with Engineering Degrees," AC 2011-724, ASEE 2011 Annual Conference Proceedings.
- Plett, M. (2011), "Improved Transient Oscillation Detection with Multiwavelets," Proceedings of the IEEE 2011 International Conference on Acoustics, Speech and Signal Processing.
- VanAntwerp, J., Bruxvoort, C., Plett, M., Wilson, D., "Examining Calling as a Motivator in Career Decisions: A Comparison of Engineering Graduates from Secular and Christian Undergraduate Institutions ," Proceedings of the 2011 CEEC (Christian Engineering Educators Conference), Trinity Western University, Langley, B.C., Canada, June 2011.
- Wilson, D., Plett, M., VanAntwerp J., Bruxvoort, C., "Opportunities to Serve: Important from Middle School to Retirement," Proceedings of the 2011 WEPAN (Women in Engineering Proactive Network) Conference, Seattle, WA, June 2011.
- Floyd, T., Wilson D., Campbell, R., Veilleux, N., Bates, R., Plett, M., Scott, E., Peter, D., "A Multi-Institutional Study of Connection, Community, and Engagement in STEM Education: Conceptual Model Development", AC 2010-2410, ASEE 2010 Conference Proceedings.

Curriculum Vitae

Plett, M., Peter, D., Parsons, S., Gjerding, B. (2008), "The Virtual Synchronous Classroom: Real time off-campus classroom participation with Adobe Connect," AC-2008-281, ASEE 2008 Annual Conference Proceedings.

Plett, M., Peter, D., (2007), "Self Grading for Improved Learning," AC-2007-523, ASEE 2007 Annual Conference Proceedings.

Plett, M., Beach, K. W. (2003), "Ultrasonic Self-Normalized Wavelet-Based Detection and Estimation of Unknown Transient Vibrations in Colored Gaussian Noise and Strong, Low Frequency Clutter." IEEE UFFC Ultrasonics Symposium conference proceedings.

CONFERENCE PROCEEDINGS PAPERS WITH REFEREED ABSTRACTS

Yasuhara, K., Wilson, D., Bates, R., Floyd-Smith, T., Veilleux, N., Plett, M., Campbell, R., (2010) "Student Connections to Community in Computer Science and Engineering Education", SIGCSE (Computer Science Education) Conference: Milwaukee, Wisconsin.

Plett M., Beach K.W. (2000), "Automated Ultrasonic Arterial Vibrometry: Detection and Measurement." SPIE International Symposium on Medical Imaging 2000 conference proceedings.

Plett M., Beach K., Paun M., et al (1998). "Using Doppler Ultrasound to Examine Wall Vibrations and Flow Velocity Fluctuations in Arteries." *J Acousical Society of America*, Vol. 103, No. 5, Pt. 2, May 1998.

Plett M., Beach K., Paun M., et al. (1998) "Using Pulsed Ultrasound to Explore Eddies and Vibrations Induced by Arterial Stenoses and Punctures." 2nd International Ultrasound/Magnetic Resonance/Noninvasive Conference, Seattle, WA.

WORKSHOPS WITHOUT PROCEEDINGS

Allendoerfer, R., Bates, R., Floyd, T., Plett, M., Wasilewski, C., Wilson, D. (2015). Facing the Challenge of Engaging Diverse Students in Diverse Academic Environments. Workshop conducted at the American Society of Engineering Education Conference, Seattle, Washington June 2015.

CONFERENCE TALKS NOT REFEREED

Plett, M. (2008), "Does faith affect an engineer's career path choices and non-technical engineering decisions? Do these vary by gender?" 2008 Christian Engineering Educators Conference breakout session, Geneva College, PA.

INVITED TALKS

Plett, M. (2014), "Course Level Learning Assessment", Global Early Career Faculty Virtual Mini Conference: Session 3, Becoming and Effective Instructor, Sept. 18 2014.
(http://www.ieee.org/education_careers/education/university_programs/early_career_faculty_conference.html)

Global Early Career Faculty Virtual Mini Conference Panelist: Session 2, Effective Teaching Panel, Nov. 15 2013.

(http://www.ieee.org/education_careers/education/university_programs/early_career_faculty_conference.html)

Curriculum Vitae

UNITED STATES PATENT

Beach, KW; Brown, KG; Plett, MI; Caps, MJ.; Method For Determining Phase Advancement Of Transducer Elements In High Intensity Focused Ultrasound, U.S. Patent US006042556A, March 2000.

REPORTS

Shoemaker, M. (1995), "Spectral Effects on the Signal-To-Noise-Ratio of Short Exposure Photon-Limited Stellar Data." AFOSR SFRP Final Report.

Shoemaker, M. (1994), "Frequency Domain Analysis of Short Exposure, Photon-Limited Astronomical Data." AFOSR SFRP Final Report, 1994.

(5) **Honors and Awards**

Best Presentation Award, New Engineering Educators Division, Annual Conference of the American Society of Engineering Education, 2014.

2013 Erickson Excellence in Teaching Award for the Sciences, Seattle Pacific University

Henry L. Gray Fellowship, School of Engineering, University of Washington 1996-1997

Member of Eta Kappa Nu, electrical engineering honor society, University of Washington 1992

Graduation with honors (Summa Cum Laude), Seattle Pacific University 1991

University Scholars award, Seattle Pacific University 1987-1991

(6) **Memberships**

Institute of Electrical and Electronics Engineers, senior member

American Society of Engineering Educators (WIED, ERM, Ethics and ECE divisions)

Society of Women Engineers