PERSONAL INFORMATION

Dr. Jeffrey Braunstein
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EDUCATION

Rensselaer Polytechnic Institute, Albany, New York
Ph.D. in Electrical & Computers Science Engineering **2004**
Dissertation: "Numerical Analysis of Microwave Heating Applied to Solids and Particles"

Summary: Finite element analysis applied to microwave heating of materials with temperature dependent material properties. Solutions investigated the coupled differential equations associated with wave propagation and heat diffusion. Transient and frequent domain analyses were both implemented. Principle coursework: Electromagnetic theory for high frequency applications, Plasma theory, Numerical methods

University of California at Davis
B.S. in Electrical Engineering & Computer Science **1987**
Areas of Concentration: Electrical Engineering
Principle coursework: Electromagnetics, Digital Circuits
Graduated with honors: summa cum laude
Secondary Concentration: Economics
Principle coursework: Microeconomic theory

CURRENT EMPLOYMENT

Professor of Practice – SUNY Albany **2020-Present**

Involvement in a variety of undergraduate courses: Introduction to ECE, Electric Circuits, Senior Design Lab.

TEACHING EXPERIENCE

Adjunct Professor, Lecturer, Senior Lecturer – Rensselaer Polytechnic **2008-2011**

Involvement in a variety of undergraduate courses: Introduction to Engineering Analysis, Introduction to Engineering Design, Electric Circuits, Introduction to Electronics, Fields and Waves, Embedded Control, Electric Power Lab, Electronic Instrumentation, Introduction to ECSE. The courses range from first semester freshmen to graduating seniors. Teaching styles include traditional lecture, studio format, and laboratory/project guidance. Course instructional experience included administrative control of courses and participation in team-taught courses. Course development has been an aspect of Electric Circuits and Introduction to Electronics using a simplified form of the Flipped Classroom and optional Laboratories. Additionally, revision of the Electric Power Laboratory projects was implemented.

Student IDEA survey information provided below.

Visiting Professor – Chung Ang University, South Korea **2004-2007**
Graduate and undergraduate coursework: Finite elements, Microwave theory

Classes taught via English at a Korean university, requiring greater awareness to monitor student comprehension and progress.

Graduate Instructor – Rensselaer Polytechnic Institute **2000-2004**

Undergraduate coursework: Fundamental electromagnetic theory

Studio format instruction. Smaller classes are implemented allowing greater interaction between the professor and the students.

Responsibilities included, overseeing and administering course material associated with the particular classes each semester. Continued development and analysis of existing methods of teaching for the studio format.

Educational Development – Rensselaer Polytechnic Institute **1999**

Development of simulation tools in the Matlab environment to provide visual demonstration of key concepts in several courses. Additionally, writing a basic tutorial distributed to undergraduates to provide basic familiarity with the Matlab environment.

Teaching Assistant - Rensselaer Polytechnic Institute **1994-1997**

Standard responsibilities associated with teaching assistants for numerous courses in the ECSE department.

RELATED EXPERIENCE

Microwave Researcher
The development of numerical software for simulating the microwave excitation of plasmas. The work involved refinement of existing finite element code for electromagnetic field calculation to include the effects of ionization and fluid flow inside the plasma. An iterative approach was implemented to determine the steady state plasma excitation for a given incident power and flow rate.

Ceralink, Inc. **2011-2013**

Postdoctoral Researcher
Investigating microwave heating cavities for the purpose of reducing processing times for ceramic materials. The work primarily pursued numerical solutions utilizing finite element frequency domain solutions and finite difference time domain solutions to determine field distribution inside resonant cavities loaded with lossy materials. The objective is to optimize the positioning of the feed port for improved energy delivery and refine the cavity to concentrate field in the region the ceramic material is located.

Rensselaer Polytechnic Institute **2007-2008**

Engineering Contractor
Applying high frequency signals to achieve thermal effects in a variety of media. Medical investigations pursued arrays of monopole antenna to achieve hyperthermia in cancer treatment. Secondary oil recovery from wells was pursued to increase fluid flow. Additional projects included low cost medical imaging using electrical impedance tomography.

KAI Technologies, Barrington, Massachusetts **2001-2003**

Research Scientist
Development of nondestructive testing hardware and software for monitoring defects in metallic and ceramic materials. Techniques using ultrasonic pulses and laser interferometers generated signals propagating in the media. Wavelet analysis was performed to extract signals from the noise and identify the frequency components associated with the signal.

Benet Laboratories **1998-2000**

COMPUTATIONAL BACKGROUND

- Extensive experience implementing code using ForTran and Matlab
- Familiarity with C/C++
- Background in Windows and Unix environments

RECENT IDEA SURVEY RESULTS (STUDENT COURSE EVALUATIONS, 5 POINT SCALE)

Course	Instructor rating	Course rating
Introduction to ECSE, Spring 2020	4.62	4.50
Embedded Control, Spring 2020	3.77	3.62
Introduction to Electronics, Spring 2020	4.82	4.82
Introduction to ECSE, Fall 2019	4.36	4.25
Embedded Control, Fall 2019	4.04	3.61
Introduction to Electronics, Fall 2019	4.65	4.50
Introduction to ECSE, Spring 2019	4.53	3.81
Electric Circuits, Spring 2019	4.59	4.44
Embedded Control, Spring 2019	4.42	3.96
Signals & Systems	4.33	4.20
Introduction to Electronics, Fall 2018	4.61	4.20
Introduction to ECSE, Fall 2018	4.34	4.03

PUBLICATIONS OF NOTE

- Shawn Michael Allan; Jeffrey Braunstein; Inessa Baranova; Nicholas Vandervoort; Morgana L Fall; Holly S Shulman. "*Computational Modeling and Experimental Microwave Processing of JSC-1A Lunar Simulant*", ASCE's Journal of Aerospace Engineering, May 2012
- Sheppard Salon, MVK Chari, J. Braunstein, J. Selvaggi, "*Inverse Magnetic Field Calculation for Underground Grid Condition Monitoring*", COMPUMAG, Nov. 2009
- J. Braunstein, H. S. Kim, K. Choi,"*Multiparametric Analysis and Optimization for Narrow Beams Radiating from Finite Antenna Arrays*", IEEE Trans. on Mag., Mar 2008
- J. Braunstein, H. S. Kim, H. B. Lee, T. K. Chung, U. C. Moon,"*Design Sensitivity Analysis Applied to High Temperature/High Voltage Direct Current Power Systems*", IEEE Trans. on Mag., Mar 2008
- S. Song, H. S. Kim, H. K. Jung, J. Braunstein, U. C. Moon, "*Frequency-domain Analysis of Microstrip Filter and Antenna using Adaptive Frequency Sampling Moment Method"*, ", IEEE Trans. on Mar., 2005
- J. Braunstein, Y. S. Kwak, H. S. Kim, J. S. Park, T. Anderson, "*Reconfigurable Antenna Using Switchable Reflectors"*, KIEE Conference, May, 2005
- J. Braunstein, K. Connor, S. Salon, L. Libelo, "*Investigation of microwave heating with time varying material properties*", IEEE Trans. on Mag., 35(3),pp1813-1816, 1999
- J. Borrego, K. Connor, J. Braunstein, "*Measurements of Dielectric Properties for Intense Heating Applications*", Microwave Processing of Materials V,Materials Research Society, pp 231-236, 1996
- K. Connor, J. Braunstein, S. Salon, H. Kim, "*Investigation of the Dielectric Properties of Particles by Finite Element Analysis*", IEEE Trans. on Mag. Vol. 34, No. 5, pp 2779-2782, Sep. 1998

PATENTS

- Nondestruction coating adhesion evaluation using surface ultrasonic waves and wavelet analysis, July, 2003

HONORS

- Tau Beta Pi, Phi Beta Kappa, Pi Mu Epsilon
- HKN Distinguished Faculty Award, 2016
- Faculty Recognition Award by RPI 2018 Graduating Seniors
- David M. Darrin ‘40 Counseling Award, 2020