MELINDA PIKET-MAY

Curriculum Vitae

Address:	Electrical, Computer and Energy Engineering University of Colorado Boulder		
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RESEARCH INTERESTS

High Speed Digital Engineering: Includes the topics of signal integrity, power integrity and electromagnetic compatibility. When digital signal bandwidths exceed even 100 MHz, the electrical properties of the interconnects can play a dominant role affecting system performance. Interconnect design, from the IC packages, the printed circuit boards, the connectors and cables can affect signals, power distribution and the ability for a product to pass an EMC certification test.

Numerical modeling of electromagnetic phenomena at RF, microwave, and optical frequencies: Applications include high-speed digital circuit simulation and packaging, optical devices and interconnects, antennas, electromagnetic compatibility, electromagnetic interference, and interactions with human tissue.

Engineering Education:

Interactive/collaborative education, research as education, first-year engineering, K-12 engineering education outreach, engineering recruiting and retention, and assessment of engineering curriculum.

Community Engineering:

Designing for the community, multidisciplinary design education through designing client based assistive technology devices and educational exhibits. Diversity initiatives. First Generation initiatives.

EDUCATION

Northwestern University; Evanston, IL

Ph.D. in Electrical Engineering Fall 1993.

"Computational Electromagnetics for High-Speed Digital Design"

M.S. in Electrical Engineering June 1990.

"Computational Electromagnetics for Biological Applications; Hyperthermia Cancer Treatment & Study of the Retinal Rod of the Eye"

University of Illinois at Urbana-Champaign; Urbana, IL B.S. in Electrical Engineering, Biomedical Engineering track, June 1988.

University of Lancaster; Lancaster, England Electrical Engineering Exchange, Fall 1985.

EXPERIENCE

University of Colorado - Boulder; Boulder, CO

<u>Associate Professor (6/2000 -)</u> <u>Assistant Professor (8/1993 – 5/2000)</u>: Tenured faculty member in the Electrical, Computer and Energy Engineering Department. Research Areas; High-Speed Digital Design, Computational Electrodynamics, Undergraduate Education and Assessment, Assistive Technology.

Interim Associate Vice Chancellor of Research (8/2001 - 8/2002): Work with the Vice-Chancellor for Research at CU-Boulder to support campus wide research activities. Worked on research policies and programs. Served on various campus committees and represented CU-Boulder research to the community.

University of Colorado - Boulder; Boulder, CO

<u>Chair of CU System Faculty Council (7/2012 – 7/2014)</u>: Direct the CU System Faculty Council activities representing more than 3,000 tenured/tenure track faculty and 1,500 full-time non-tenure track instructors from all four campuses. Serve as a liaison to the Board of Regents and faculty. Participate in system wide initiatives like the climate survey. Review system-wide academic and administrative policies. Committees: Educational Policies and University Standards Committee (EPUS), Budget Committee, GLBTI Committee, Ethnic and Minority Affairs Committee, Ad-hoc Communication and Excellence Committee, Personnel Committee, Women's Committee, Ad-hoc Salary and Climate Committee, President's Task Force on Teaching and Technology.

<u>Chair of Boulder Faculty Assembly (7/2015 – 7/2016)</u>: Direct the Boulder Faculty Assembly activities which include the executive committee and 14 other committees. Serve as a liaison between the Board of Regents and Boulder faculty. Participate in campus wide initiatives. Review campus academic and administrative policies.

Director of the High Speed Digital Engineering Professional Master's Program (1/2023 -):

American Council on Education (ACE) Colorado Network of Women Leaders (CNWL) Academic Management Institute (AMI); Denver CO

<u>Director (2011 - 2014)</u>: This program brings together more than 50 rising leaders from the states of CO and WY colleges and universities each year. The gather multiple times during a year for advanced career development. Leading administrators from academia and the community join us for talks and discussions. As director I developed the curriculum and arranged all of the speakers, resources necessary and accommodations.

Executive Board Member (2014-2017, 2021-2024): member of the AMI governing board and the Colorado Network of Women Leaders. We work to further initiatives for professional development to advance women in all levels of academia.

Northwestern University; Evanston, IL

<u>Research Assistant (September 1988-July 1993)</u>: (under Cabell Fellowship) Developed a variety of FD-TD electromagnetic simulation models and techniques for biomedical and circuit applications. Supervised undergraduate research projects.

Cray Research, Inc.; Chippewa Falls, WI/Eagan, MN

Intern (Summer 1991-1992, Spring 1993): Developed the simulation software tool called Electromagnetic Design System (EMDS) from scratch. Developed finite-difference time-domain electromagnetic simulation models for complex 3-D structures, including biomedical applications military aircraft, multi-layered circuit board modules, and linear/non-linear digital circuits.

Waubonsee Community College; Sugar Grove, IL

<u>Mathematics Faculty (August 1990-December 1992)</u>: Developed and taught real-world application-based courses in the mathematics department.

Naval Research Laboratory; Washington D.C.

Engineering Consultant (July 1989, Sept. 1990): Developed finite-difference time-domain electromagnetic simulation codes using FORTRAN 90 for defense related applications running on a Connection High Speed Computing Machine (parallel processing).

National High School Institute; Northwestern University, IL

Engineering/Science Division Faculty (July 1990): Taught a summer course in medical instrumentation to high school juniors and seniors. Supervised independent study projects.

Fermi National Accelerator Laboratory; Batavia, IL

<u>Engineering Intern (Summer 1988)</u>: Wrote code to control CAMAC data acquisition cards for the superconducting super-collider magnets in the magnet development and test facility.

<u>Co-op Education Engineering Student (August 1984-August 1987)</u>: Particle Instrumentation Group; provided technical support in the design and development of high speed, digital and analog, small signal instrumentation for the front-end electronics used in particle accelerator detectors.

University of Illinois; Urbana, IL

<u>ECEE Teaching Assistant (August 1987-May 1988)</u>: Re-developed and taught a biomedical instrumentation lab using computer instrumentation for the first time.

Physics Lab Researcher (January 1885-May 1988): Fabrication and instrumentation technology support.

AWARDS AND RECOGNITION

2019-2022 Timmerhaus Teaching Ambassadorship Award, CU System Award based on teaching and outreach service

2018 Department of Electrical, Computer and Energy Engineering Excellence in Service Award

2017 Selected as a University of Colorado Boulder, College of Engineering and Applied Science **BOLD fellow** (Broadening Opportunity through Leadership and Diversity)

2017 Selected as a University of Colorado Boulder **Engage Faculty Fellow** to expand, deepen, and institutionalize community-based learning at CU Boulder

2014 University of Colorado at Boulder *BFA Faculty Recognition Award* for continued support of the CU community through service activities.

2012 University of Colorado System Faculty Council Distinguished Service Award 2011

University of Colorado Boulder Faculty Assembly "Excellence in Service" Award 2009

University of Colorado Boulder Women Who Make a Difference Award

2004 Editor's Choice Award for Poem "Memories" in Touch of Tomorrow, International Library of Poetry

2002 **Elizabeth E. Gee Memorial Lectureship Award** Selected by CU System for record of: Advancing women in academia and community activism; Research, teaching, and/or service that pushes the boundaries of disciplinary knowledge and makes connections between disciplines; Significant and original scholarship and/or creative work; Distinguished record in teaching excellence

2001-2002 Selected as an inaugural Leadership Education for Advancement and Promotion (LEAP) fellow; NSF's Increasing the Participation and Advancement of Women in Academic Science and Engineering Careers (ADVANCE) Institutional Transformation Award

2002 Selected as a finalist for the American Council on Education Fellow Program

2001-2002 Pew-Carnegie Teaching Scholar Award - Selected as a **CASTL fellow** for the Carnegie Academy for the Scholarship of Teaching and Learning (CASTL). 50 faculty nationwide were chosen

2001-2002 Selected as an Emerging Leadership Fellow (ELP) for the University of Colorado 2001

Advisor to COE "Outstanding Undergraduate Research Award" recipient; Todd Lammers

2000 HandiSwing displayed at Smithsonian Museum

2000 College of Engineering **Peebles Teaching Award** for "demonstrating a unique commitment to students through innovations in engineering education"

2000 Biography included on **National Academy of Engineering** "Celebrating Women in Engineering" Web page <u>http://www.nae.edu/nae/cwe</u>

1999 American Society of Engineering Education (ASEE) FIE Helen Plant Award for "Teaching Creativity"

1999 Best Paper of Session, International Materials and Packaging Society Annual Conference

1999 HandiSwing first year design research project displayed at Smithsonian History Museum

1999 Advisor to COE "Outstanding Undergraduate Research Award" recipient; Ian Rumsey

1997-2001 National Science Foundation CAREER Award

1997 Sloan New Faculty Fellow for the International Frontiers in Education Conference

1996 International Union of Radio Science Young Scientist Award

1996 Faculty Advisor for IEEE Outstanding Student Chapter

1994 Junior Faculty Development Award; University of Colorado at Boulder

1988 - 1993 Cabell Fellowship (tuition and stipend) to Northwestern University

Administrative Council Appointments

2010-2012 Elected Applied Computational Electromagnetic Society (ACES) Administrative Council

2004-2006 Elected Treasurer of National Society of Women Engineers (SWE)

2001-2004 Elected IEEE Education Division Administrative Council

2001-2002 Elected **Treasurer** for American Society of Engineering Education - Women in Engineering (WIE) Division

1999-2001 Elected to International Union of Radio Science (URSI) Administrative Council

1999-2000 Elected Secretary of URSI Commission D

1997-2001 Elected to IEEE Antennas and Wave Propagation International Administrative Council

Editorial Work

2001-2006 Associate Editor for IEEE Microwave and Wireless Components Letters

2000-2001 **Newsletter Editor** of Perspectives in Electromagnetics for Applied Computational Electromagnetics Society Journal

1997-2005 Associate Editor for IEEE Antennas and Wave Propagation Society Journal

LEADERSHIP ACTIVITIES

- 2021-2023 Faculty Advisory to Colorado Commission on Higher Education
- 2018-2019 Elected to be **President of the PAC 12 Academic Leadership Coalition**; improve the effectiveness and responsiveness of shared governance organization; and facilitate academic and research cooperation beneficial to participating institutions.
- 2017 National Certification as a Gallup Strength's Coach
- 2015-2017 Chair of the Boulder Faculty Assembly (faculty governance)
- 2015-2017, 2022-2014, 2022-2024 Vice-Chair of the State of Colorado Faculty Advisory Committee (CFAC)
- 2012-2014 Chair of the University of Colorado System Faculty Council (faculty governance)
- 2013 Certified facilitator for Gallup Strengths Based Leadership workshop
- 2011 National Certification as a facilitator for NCWIT COLORS workshops
- 2011-2012 Chair of the Faculty Council Women's Committee
- 2011-2012 Chair of the Faculty Council Communication Committee
- 2011 Leadership in Engineering Education 2-Day Workshop, American Society for Engineering Education
- 2010-2012 Chair of the Boulder Faculty Assembly Diversity Committee
- 2010-2012 Secretary of the Faculty Council Budget Committee
- 2010 Carnegie Teaching and Learning Conference (CASTL), Omaha, NE
- 2009-2010 Chair of the Boulder Faculty Assembly Administrator Appraisal Committee
- 2009-2011 Elected to an at-large position on the Executive Committee of the Boulder Faculty Assembly
- 2008 2013, 2018 2020 Faculty Chair of the Chancellors Committee on Women (CCW)
- 2009-2015 Organizing committee for and/or chaired the CU Women Succeeding Symposium
- 2009-2011 Elected member-at-large rep of the Boulder Faculty Assembly to the System Faculty Council
- 2009-2011 Investigator in CU's President's Teaching and Learning Collaborative, a **Carnegie Academy for the Scholarship of Teaching and Learning** (CASTL) program
- 2009-2010 Selected to participate in the **Academic Management Institute** (AMI). A program to develop women leaders in Academia
- 2005-2008 re-elected 2008-2011 Selected to be a member of the **National Academy of Science** (NAS) Physics Division Committee on Radio Frequencies (CORF)
- 2009 National Academy of Science team trip to San Pedro, Chile on an ambassador mission to the Atacama Large Millimeter/submillimeter Array (ALMA). It is the world's most advanced radio astronomy observatory currently under construction at 5000 m in altitude in the Chilean Andes
- 2007 Research in Engineering Education Workshop, American Society for Engineering Education, Golden, CO
- 2006 Technical Program Chair, "Frontiers in Education" IEEE Education Society Representative
- 2005-2014 Founding member of steering committee for the Institute for Ethics and Civil Engagement
- 2003 **General Chair** with James Avery of ASEE/IEEE "Frontiers in Education" Conference, "Engineering as a Human Endeavor; Partnering Academia, Government, Industry and Community", 600+ international attendees.

- 2003 **Keynote** at "Self-Leadership: Women Succeeding in the Professoriate" A University of Colorado Symposium, Denver Campus
- 2002 Participated in a national planning conference "Liberal Studies and the Integrated Engineering Education of ABET 2000" sponsored by **NSF** (35 faculty nationwide invited)
- 2002 Participated in a national discussion / colloquy on "Developing a teaching and learning center in engineering" sponsored by the **National Academy of Engineering** (30 faculty nationwide invited)
- 2002 Participated in a national Distance Education Colloquy "Learning Objectives for Engineering Education Laboratories; What Are They?" sponsored by **ABET & Alfred P. Sloan Foundation** (50 faculty nationwide chosen to participate)
- 2001 Invited to be a member of the national Future Engineering Education Leadership (FEEL)
- 2000 Technical Program Committee for National Radio Science Institute Conference
- 2000 Elected to membership to URSI Commission B; Numerical Methods
- 1999-2000 Chair of Denver Local IEEE MTT/APS/GRSS Society
- 1999 Elected to Senior Membership in the Institute of Electronics and Electrical Engineers
- 1998 Participant in *National Academy of Engineering* Fourth Annual Symposium on Frontiers in Engineering, Irvine, CA (participation by invitation)
- 1997 NSF conference Achieving Success in Academia, Washington D.C. (participation by invitation)
- 1995 Elected to membership to URSI Commission D; High Speed Devices
- 1993, 1994, 1996, 1998, 1999 Participant in Los Alamos National Lab and Lincoln Lab *Conference on High-Speed Computing*, OR (participation by invitation)

PROFESSIONAL ACTIVITIES and DEVELOPMENT

Funding Agency Reviews

National Science Foundation (NSF) Technical Review Panels

NSF Educational Review Panels

NSF Graduate Fellowship Reviewer

NSF Educational SMART Reviewer

NSF Curriculum, Course, and Lab Improvement (CCLI) Review Panels

National Center for Innovation and Invention in Academia (NCIIA) Review Panels

Review Papers For

IEEE Antennas and Wave Propagation Society

- IEEE Microwave Theories and Techniques Society
- IEEE Electromagnetic Compliance Society
- IEEE Components Manufacturing and Packaging Technology Society, Part B
- **IEEE Education Society**

American Society of Engineering Education Journal

Applied Computational Electromagnetics Society Journal

International Journal of Numerical Modeling; Electronic Networks, Devices and Fields

Physics Review

Selected Professional Society Participation

Senior Member of Institute of Electronics and Electrical Engineers (IEEE) Antennas and Wave

Propagation Society (APS)

APS administrative council member APS representative to Society for Sociological Impact of Technology APS Education Committee

Microwave Theories and Techniques Society Electromagnetic Compliance Society

Components Manufacturing and Packaging Technology Society Education Society

2012-current Colorado Faculty Advisory Committee (CFAC)

2010, 2011, 2013 Colorado Learning with Technology (COLT) Conference 2000

Denver Section Chair for IEEE APS/MTT/IGARSS Chapter

1998 Participant in National Center for Innovation and Invention in Academia Teaching Creativity Workshop

1997 Participant in North Carolina's Center for Success in the First Year Seminar on *First Year Students and Success*, Denver, CO

1996, 1997, 1998 Participant in Teaching and Technology Conference, Golden, CO

1995-2010 Faculty Advisor for IEEE student group, Boulder, CO

1994-current Member of American Society of Engineering Education

1994-current Member of Applied Computational Electromagnetics Society

1994-2000 Member of NSF CampMODE Research Center

1994 Participant in Faculty Honors Seminar on Teaching and Learning, Boulder, CO

Selected Conference Activities

2022, 2023 Technical Program Committee IEEE Antennas and Wave Propagation (APS) Conference

2004, 2005, 2009, 2010, 2011 Speaker for Women Succeeding in Academia

2003 Judge for "Helen Plant Award" for Frontiers in Education Conference

1999 Judge for the "Helen Dryer Best Paper Award" at Frontiers in Education Conference

- 1999 Chaired Session "A College Based Program for Enhancing Teaching and Learning" at Frontiers in Education Conference, Puerto Rico
- 1999 Chaired technical session for the International Conference on Electromagnetics in Advanced Applications, Torino, Italy
- 1998 On the Organizing Committee for *The Eighth Biennial IEEE Conference on Electromagnetic Field Computation*, Tucson, Arizona
- 1996 Chaired technical session for the International National Radio Science Institute General Assembly, Lille, France
- 1994, 1998, 1999, 2014 Organized and Chaired sessions at the IEEE APS Conference
- 1996, 1997, 1998, 2000 Organized and Chaired sessions at Applied Computational Electromagnetics Society Annual Conference, Monterey, CA

- 1995, 1996, 1998, 1999, 2000 Organized and Chaired Sessions at the National Radio Science Institute conference, Boulder, CO
- 1994 Moderator of conference session for Colorado Advanced Software Institute (CASI)

Selected Mentoring

Mentoring a National Science Foundation, Post Doc Fellow Math Engineering and Technology Education (PSFMETE) Post Doc Education Researcher (Julie Chang) 1/1998-12/1999

Mentoring National Science Foundation GK-12 Fellows

Students funded with full RA, performs 20 hours a week of outreach in the school; Boulder High School Honors Physics Program (Alex Settle) 8/1999-5/2000 Casey Middle School Science (4 students) 8/2000 – 6/2002

Selected University of Colorado Activities

- 2016-2018 System Concurrent Enrollment Committee
- 2016-2018 Inter-campus tuition benefit committee
- 2010-2014 BFA Budget and Planning committee 2006-2010, BFA resource member
- 2012-2014: Involved in the campus discussion about the external Title IX review, involved in the review of candidates and involved in the hiring of the new Title IX director
- 2010: Office of Diversity Equity and Civic Engagement (ODECE) external advisory committee meeting
- 2011-2013 Campus committee evaluating the information technology on campus
- 2010-2011 Campus committee for the student climate survey
- 2010-2011 University system wide Diversity Awards/Grants Committee
- 2010-current Chair of the CCW awards committee
- 2005-2014 Ethics and Civic Engagement Educational Programs awards committee for the Institute for Ethics and Civil Engagement
- 2005-2014 Civic Engagement Awards Committee for the Institute for Ethics and Civil Engagement
- 2010-2018 Fund Raiser for the Faculty Council women's committee Women Succeeding in Academia Symposium
- 2009-2018 Chair; Elizabeth Gee Award Selection Committee for System Faculty Council
- 2009-2011 Member of the Faculty Council representing the BFA
- 2009-2011 Organizing committee (and co-chair 2010) for the November 2-day **Chancellors Diversity Conference**. University of Colorado at Boulder
- 2009-2013 BFA Representative to the Diversity Committee
- 2010-2016 Organizing Committee for the Accessing Higher Ground (AHG) Accessible Media, Web and Technology Conference
- 2000-2005 BFA Representative to the Chancellor's Advisory Committee on Public Access
- 2001-2020 Electrical Engineering representative on the Boulder Faculty Assembly
- 2000-current: Member of the Awards/Scholarship Committee, College of Engineering
- 2000-current: Member of the Assessment Committee, College of Engineering
- 1999-2000 Dean's Committee on Strategic Planning, College of Engineering
- 1998 Co-Developer and facilitator for the Minority Success Institute
- 1997-2008 Women in Engineering, Faculty Advisory Board, College of Engineering

- 1996-2012 Faculty Advisor to IEEE student chapter
- 1996 Member of Information Technology and Social Science Research Group
- 1996 Dean's Committee on Multidisciplinary Education, College of Engineering
- 1995-2002 University of Colorado Speakers Bureau; talks to K-12 Schools on "Understanding Engineering"
- 1995 Dean's Committee on Strategic Prioritization, College of Engineering
- 1995-2002 Speaker for University of Colorado's Faculty Teaching Excellence Program (FTEP) Seminars
- 1995-2018 Participate in High School Honors Institute, Engineering Open House, and Engineering Career Day for High School Women
- 1994-2001 Member of Assessment Committee for Integrated Teaching and Learning Lab
- 1994-1999 Member of the Integrated Teaching and Learning Lab Task Force
- 1994 Diversity Planning Committee, College of Engineering

VIDEOS

- 1. NBC Nightline National News "Compassionate Engineering", a piece on my assistive technology engineering design course <u>http://tinyurl.com/NBC-ATvideo</u>
- 2. Channel 9 Local News "The Assistive Glove" http://tinyurl.com/AssistiveGlove
- 3. Coleman Conference "Imagine! and University of Colorado Collaboration in Assistive Technology" <u>http://tinyurl.com/ColemanImagine</u>
- 4. College of Engineering Freshman Design Expo "Research Project Student Presentations" http://tinyurl.com/AtechDesignExpo
- 5. Imagine! University of Colorado, College of Engineering, Piket-May https://youtu.be/dOWtHUK9oJA
- 6. Imagine! / CU Assistive Tech Projects: A Retrospective (2 minutes) https://www.youtube.com/watch?v=dOWtHUK9oJA

BOOK CHAPTERS

- **1.** Piket-May and Taflove, Chapter 13; "FDTD Modeling of High Speed Digital Circuits" in *Computational Electrodynamics*, Editor: Allen Taflove, Artech House, 1996, pp 431-474.
- **2.** Houshmand, Piket-May, Chapter 8; "High Speed Electronic Circuits with Active and Nonlinear Components" in *Advances in Computational Electrodynamics*, Editor: Allen Taflove, Artech House, 1998, pp 461-512.
- **3.** Piket-May, Houshmand, Itoh, Chapter 15; "High Speed Electronic Circuits with Active and Nonlinear Components" in *Computational Electrodynamics*, Editor: Allen Taflove, Susan Hagness, Artech House, 2000, pp 703-764.
- **4.** Taflove, Hagness, Piket-May, Chapter 9 in section V; Electromagnetics; "Computational Electromagnetics: The Finite Difference Time Domain Method" in *The Electrical Engineering Handbook*, Editor Wai-Kai Chen, Elsevier Academic Press, 2005, pp 629-670.
- Hadi, Elsherbeni, Bollimuntha, Piket-May, "FDTD in Cartesian and Spherical Grids." in *Computational Photonic Sensors* Editor: Hameed M; Obayya S. (Cham: Springer, January 10, 2019) 153-175. (Published online June 14, 2018)

PODCAST

https://www.colorado.edu/cuengage/2017/12/27/amplify-december-27th-faculty-fellowsedition-engineering-students-design-assistive

WEBINAR

1.5 hour national Webinar: 6/13/2018 ANCOR, Imagine!, and University of Colorado, Boulder, Melinda Piket-May, Brodie Schulze, Fred Hobbs, "Partnering with Universities for Individualized I/DD Technology Solutions" *This was a national Webinar INVITED and run by ANCOR. The American Network of Community Options and Resources (ANCOR) is a national, nonprofit trade association representing more than 1,600 private community providers of services to people with disabilities. Combined, they support over one million individuals with disabilities.*

HANDBOOKS

- National Academy of Science, Committee on Radio Frequencies (CORF) sub-panel that wrote the "Handbook of Frequency Allocations and Spectrum Protection for Scientific Uses". National Academies Press. ISBN #13 978-0-309-10301-5
- National Academy of Science, Committee on Radio Frequencies sub-panel that wrote "Views of the NAS and NAE on Agenda Items at Issue at the World Radio Communication Conference 2012," http://www.nap.edu

SAMPLE FCC FILINGS (with CORF)

- Committee on Radio Frequencies FCC filing August 16th 2007: The impact of proposed vehicle- mounted Earth Station/fixed satellite on Radio Astronomy observations at 14.47 14.50 GHz; protection of observations in this band with coordination requirements.
- Committee on Radio Frequencies FCC filing August 13th 2007: The potential impact of proposed permanent fixed microwave operations in the 4940 4990 MHz (4.9 GHz) band on radio astronomy observations.
- Committee on Radio Frequencies FCC filing February 5th 2007: The importance of the scientific observations in the Earth Explorations Satellites band at 36.0 to 37.0 GHz and the need to protect them. Also, FCC should reinstate a mandatory power limit.

PAPERS

Over 200 Journal & Conference Papers and Presentations

PEER REVIEWED JOURNAL PAPERS

- Katz, D., M. Piket-May, A. Taflove, and K. Umashankar, "FD-TD Analysis of Electromagnetic Wave Radiation from Systems Containing Horn Antennas", *IEEE Transactions on Antennas and Wave Propagation* **39**, 1203-1212, 1991.
- Piket-May, M., A. Taflove, W. Lin, D. Katz, V. Sathiaseelan, and B. Mittal, "Computational Modeling of Electromagnetic Hyperthermia: Three-Dimensional and Patient-Specific", *IEEE Trans. Biomedical Engineering* 39, 226-237, 1992.
- Sathiaseelan, V., A. Taflove, M. Piket-May, C. Reuter, and B. Mittal, "Application of Numerical Modeling

Techniques in Electromagnetic Hyperthermia", *Journal of Applied Computational Electromagnetics Society* **7**, 61-71, 1992.

- Piket-May, M., A. Taflove, and J. Troy, "Electrodynamics of Visible Light Interactions with the Vertebrate Retinal Rod", *Optics Letters* **18**, 568-570, 1993.
- Thomas, V., M. Jones, M. Piket-May, A. Taflove, and E. Harrigan, "The Use of SPICE Lumped Circuits as Subgrid Models for FD-TD Analysis", *IEEE Micro. Guided Wave Letters* **4**,141-143, July 1994.
- Piket-May, M., A. Taflove, and J. Baron, "FD-TD Modeling of Digital Signal Propagation in 3-D Circuits with Active and Passive Loads", *IEEE Transactions on Microwave Theory and Technique* **42**, 1514-1523, August 1994.
- Hadi, M., and M. Piket-May, "A Modified FDTD 2,4 Scheme for modeling Electrically Large Structures with High Phase Accuracy", *IEEE Transactions on Antennas and Wave Propagation* **45**, 254-264, February 1997.
- Marshall, T., and M. Piket-May, "Finite-Difference Time-Domain Modeling of Light Trapping in Solar Cells", *Applied Computational Electromagnetics Society Journal* **12**, 31-42, November 1997.
- Sheppard, Jenison, Agogino, Brereton, Bucciarelli, Dally, Demel, Dym, Evans, Faste, Henderson, Minderman, Mitchell, Oladipupo, Piket-May, Quinn, Regan, Wujeket, "Examples of Freshman Design Education", *International Journal of Engineering Education* **13**, Number 4, 1997.
- Vichot, P., Z. Schoenborn, J. Mix, J. Dunn, and M. Piket-May, "Numerical modeling of a clock distribution network for a superconducting multichip module", *IEEE Transactions on Components, Packaging and Manufacturing, Technology, Part B: Advanced Packaging*, Vol. 21, no. 1, 98-104, February 1998.
- Thomas, K., R. Gravrok, G. Haussmann, M. Piket-May, "Implementation and application of a FD-TD simulation tool for the analysis of complex 3D structures", **invited paper** to *Applied Computational Electromagnetics Society Journal, Special Issue on Computational Electromagnetics*, **13**, No. 2, 160-167, 1998.
- Reuter, C., A. Taflove, V. Sathiaseelan, M. Piket-May, B. Mittal, "Unexpected Physical Phenomena Indicated by FDTD Modeling of the Sigma-60 Deep Hyperthermia Applicator", *IEEE Transactions on Microwave Theory and Technique* **46**, pp. 313-319, April 1998.
- Gravrok, R., A. Byers, M. Piket-May, "A Novel Way of Calculating System Inductance", *International Journal on Microcircuits and Electronic Packaging (IMAPS)*, 1998.
- Rumsey, I., P. Kelly, M. Piket-May, "Photonic Bandgap Structures used as Filters in Microstrip Circuits", *IEEE Microwave Guided Waves and Letters*, 336-338, 1998.
- Piket-May, M., B. Sopori, "Numerical Model of Light-Trapping in Solar Cells", (invited technical feature paper) to *Applied Computational Electromagnetics*, Volume 13, No. 2, 13-18, 1998.
- Mix, J., J. Dixon, Z. Popovic, M. Piket-May, "Incorporating non-linear lumped elements in FDTD: the equivalent source method", (invited) International Journal of Numerical Modeling; Electronic Networks, Devices and Fields, 12, 157-170, 1999.
- Byers, A., S. Hall, M. Piket-May, "Modeling Ground Bounce Effects in High Speed Design", (invited) *International Journal of Microcircuits and Electronic Packaging*, Issue III, Vol. 22, No. 3, 1999.
- Kelly, K., M. Piket-May, "Propagation Characteristics for a One Dimensional Grounded Finite Height Finite Length Electromagnetic Crystal", *Journal of Lightwave Technology*, November 1999.
- Bhobe, Holloway, Hall, Piket-May, "Coplanar Waveguide Fed Wideband Slot Antenna", *IEE Electronics Letters*, 1340-1342, Volume 36, number 16, August 3, 2000.
- Fornberg, P.; Kanda, M.; Lasek, C.; Hall, S.; Piket-May, M., "The Impact of a Non-Ideal Return Path on

Differential Signal Integrity", *IEEE Trans. on Electromagnetic Compatibility*, Vol 44, NO 1, February 2002, pp.11-15.

- Vichot, P.A.; Grabow, B.E.; Piket-May, M., "High-speed operation of a low-power 4-bit serial-to- parallel converter", *IEEE Transactions on Applied Superconductivity*, Volume: 12, Issue: 4, December 2002, pp.1891-1896.
- E.F. Kuester, M. A. Mohamed, Melinda Piket-May, C. Holloway, "Averaged Transition Conditions for Electromagnetic Fields at a Metafilm", *IEEE Trans. on Antennas and Propagation, special issue on Metamaterials*, Vol. 51, October 2003, pp.2641-2651.
- Staker, S. W., Holloway, C. L., Bhobe, A.U., Piket-May, M., "Alternating-Direction Implicit (ADI) Formulation of the Finite-Difference Time-Domain (FDTD) Method: Algorithm and Material Dispersion Implementation", *IEEE Trans. on Electromagnetic Compatibility, special issue on Advanced EMC Numerical Modeling*, Vol. 45, No. 2, May 2004, pp.156-166.
- Bhobe, A. U, Holloway, C. L, Piket-May, M, Hall, R, 'Wide-Band Slot Antennas with CPW feed lines: Hybrid and Log-Periodic Designs', *IEEE Trans. on Antennas and Propagation (special issue on Metamaterials)*, Vol. 52, October 2004.
- F. Schlottau, M. Piket-May, and K. Wagner, "Modeling of femtosecond pulse interaction with inhomogeneously broadened media using an iterative predictor corrector FDTD method," *Optics Express* 13, 182-194, 2005.
- M. A. Mohamed, E. F. Kuester, C. L. Holloway, and M. Piket-May, "The Field of an Electric Dipole and the Polarizability of a conducting Object Embedded in the Interface Between Dielectric Materials," *Progress In Electromagnetics Research B*, Vol. 16, 1-20, 2009.
- AA Aly, M. Piket-May, "FDTD Computation for SAR induced in human head due to exposure to EMF from mobile phone", *Advanced Computing*, Vol. 5, No.5/6, 2014.
- R. Smith, A. Weiss, R. Bollimuntha, M. Piket-May, M. F. Hadi and A. Elsherbeni, "Merging VSim's Model Building and Visualization Tools with Custom FDTD Engines," *ACES Express Journal*, vol. 1, No. 1, pp. 16–19, January 2016
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- <u>Piket-May, M.</u>, J. Avery, L. Carlson, J. Sullivan, "Integrated Teaching and Learning Lab", 90-minute (invited presentation), *National Science Foundation Teaching and Technology Conference*, Golden, Colorado, July 1997.
- <u>Piket-May, M.</u>, J. Avery, "Designing for the Community", (invited presentation) 1997 Annual Conference of the Rocky Mountain American Society of Engineering Educators, Logan, Utah, August 1997.
- <u>Avery, J.</u>, M. Piket-May, "Integrated Teaching and Learning", (invited presentation) 1997 Annual Conference of the Rocky Mountain American Society of Engineering Educators, Logan, Utah, August 1997.
- <u>Piket-May, M.</u>, "Learning Interactively: Electromagnetics Case Study", on CD-ROM, Session F2I, *Proceedings of the 1997 IEEE Frontiers in Education Conference*, Pittsburgh, PN, November 1997.
- <u>Avery, J.</u>, M. Piket-May, J. Sullivan, L. Carlson, "Initial Results Teaching and Learning the Integrated Teaching and Learning Lab", on CD-ROM, Session S3F, *Proceedings of the 1997 IEEE Frontiers in Education Conference*, Pittsburgh, Pennsylvania, November 1997.
- Kelly, K., M. Piket-May, <u>I. Rumsey</u>, "Investigation of a Novel Technique for Increasing the Bandwidth of the Conventional Microstrip Patch Antennas", Session B-1, p. 10, *Proceedings of the National Radio Science Meeting*, Boulder, Colorado, January 1998.
- <u>Haussmann, G.</u>, M. Piket-May, "A Uniaxial Perfectly Matched Layer Implementation for Higher Order FDTD Simulations", (invited presentation) Session B-2, p. 126, *Proceedings of the National Radio Science Meeting*, Boulder, Colorado, January 1998.
- <u>Boots, B.</u>, M. Piket-May, R. Gravrok, A. Byers, "Extraction of Power Distribution Inductance and Capacitance from Numerical Field Data", Session B-7, p. 312, *Proceedings of the National Radio Science Meeting*, Boulder, Colorado, January 1998.
- <u>Haussmann, G.</u>, M. Piket-May, "Analysis of Electrically Large Structures with a Dispersion-Optimized Finite-Difference Time-Domain Method", *The Eighth Biennial IEEE Conference on Electromagnetic Field Computation*, 1998 IEEE Magnetics Society Conference, Tucson, Arizona, June 1998.
- <u>Kelly, K.</u>, M. Piket-May, "Photonic Band Gap Structures for Antennas", *1998 IEEE Antenna Propagation Society Conference and URSI North American Radio Science Meeting*, Atlanta, Georgia, June 1998.
- <u>Mix, J.</u>, J. Dixon, Z. Popovic, M. Piket-May, "Nonlinear FDTD Modeling of Transistors", *1998 IEEE Antenna Propagation Society Conference and URSI North American Radio Science Meeting*, Atlanta, Georgia, June 1998.
- Rumsey, I., K. Kelly, A. Byers, M. Niyompong, <u>M. Piket-May</u>, "Characterizing Photonic BandGap Microstrips and Striplines", *1998 IEEE Antenna Propagation Society Conference*, Atlanta, Georgia, June 1998.
- <u>Byers, A</u>., S. Hall, M. Piket-May, "Non-Ideal Ground Return Path Measurements and Modeling" *Proceedings* of the National Academies of Sciences and Engineering Radio Science Meeting, 117, Boulder, CO, January 1999.
- <u>Kelly, P.K</u>., T. Lammers, M. Piket-May, "Investigation of Surface Wave Mitigation using Photonic Bandgap Substrates", *Proceedings of the National Academies of Sciences and Engineering Radio Science Meeting*, 215, Boulder, CO, January 1999.
- <u>Rumsey, I., J. Mix, M. Piket-May, "Integrating Lumped Circuit Models into FDTD Simulations"</u>, *Proceedings of the National Academies of Sciences and Engineering Radio Science Meeting*, 254, Boulder, CO, January 1999.
- <u>Bhobe, A.</u>, M. Piket-May, "Circularly Polarized CPW Fed Slot Antenna", *Proceedings of the National Academies of Sciences and Engineering Radio Science Meeting*, 292, Boulder, CO, January 1999.
- <u>Bhobe, A</u>., M. Haeusler, K. C. Gupta, M. Piket-May, "Design of a Wideband CPW Fed Slot Antenna", *Proceedings of the National Academies of Sciences and Engineering Radio Science Meeting*, 293, Boulder, CO, January 1999.

- Rumsey, I., T. Lammers, M. Piket-May, "Microstrip and Stripline Design for Novel Structures", Proceedings of the National Academies of Sciences and Engineering Radio Science Meeting, 298, Boulder, CO, January 1999.
- P.K. Kelly, T. Lammers, I. Rumsey, M. Piket-May, S. Hagness, "Computational Analysis of Photonic Bandgap Substrates", Workshop on Electromagnetic Crystal Structures, Design, Synthesis, and Application, Photonic Bandgap Structures, Poster ThU20, CA, January 1999.
- P.K. Kelly., Piket-May, M., Hagness "Band Diagram for a Grounded Periodic Dielectric Substrate with Square Lattice and Finite Height". 1999 IEEE Antenna Propagation Society Conference, Orlando, FL, July.
- Piket-May, M., Thomas, Gravrok, "High Speed Packaging Design and Analysis", 1999 IEEE Antenna Propagation • Society Conference, Orlando, FL, July.
- P.K. Kelly., Piket-May, M., Hagness "Surface Wave Analysis for Periodic Structures", 1999 URSI General Assembly, Toronto, Canada, August.
- Rumsey, Byers, Mix., Piket-May, "FDTD Interfaces for High Speed Circuit Design", (invited) 1999 URSI General • Assembly, Toronto, Canada, August.
- Byers, Piket-May, Hall, "Packaging Effects on Signal Integrity", (invited) 1999 URSI General Assembly, ٠ Toronto, Canada, August.
- Sung, K.Y., M. K Ah Yo, T. Lammers, A. Byers, M. Piket-May, and W. Shiroma, "Planar Photonic Bandgap ٠ Structures for Coplanar Waveguide ",1999 URSI General Assembly, Toronto, Canada, August.
- Mix, Dixon, Piket-May "FDTD Analysis of an Active Antenna Using a Nonlinear Transistor Model", 1999 URSI ٠ General Assembly, Toronto, Canada, August.
- Bhobe, Piket-May, Holloway, "CPW fed Log-Periodic Slot Antenna", 1999 URSI General Assembly, Toronto, ٠ Canada, August.
- Byers, A., P. Fornberg, M. Piket-May, "New Developments in Understanding Non-Ideal Return Paths", National ٠ Academies of Sciences and Engineering Radio Science Meeting, Boulder, CO, January 2000.
- Rumsey, I., A. Holley, M. Piket-May, "Digital Filtering Techniques used to Include Multiport Devices in FDTD Simulations", National Academies of Sciences and Engineering Radio Science Meeting, Boulder, CO, January 2000.
- Lammers, T., A. Holley, J. Huang, M. Piket-May, "Novel Designs using Frequency Selective Surfaces", National Academies of Sciences and Engineering Radio Science Meeting, Boulder, CO, January 2000.
- Piket-May, M., J. Avery, "Teaching Design using Assistive Technology Projects", NCIIA Symposium; ٠ CULTIVATING INNOVATION: Creativity & Technical Entrepreneurship in Higher Education, Washington, DC, March 9-11, 2000.
- Taflove, A., S. Hagness, M.Piket-May, "Advances in FDTD" (invited) IEEE AP-S Symposium/URSI Radio Science Meeting, Salt Lake City, UT, July 2000.
- Piket-May, M., J. Chang, "Experiential Engineering Education", Progress in Electromagnetics Research Conference (PIERS), Boston, MA, July 2000.
- Rumsey, I., M. Piket-May, "Hybrid FDTD-Frequency Dependent Network Simulations using Digital Filtering Techniques", Progress in Electromagnetics Research Conference (PIERS), Boston, MA, July 2000.
- Kelly, P.K., T. Kutrumbos, A. Byers, I. Rumsey, T. Lammers, J. Huang, S. Hagness and M. Piket-May, " Photonic • Bandgap Studies for Finite Structures", Progress in Electromagnetics Research Conference (PIERS), Boston, MA, July 2000.
- Piket-May, M., A.Taflove, S. Hagness, "Advances in FDTD", (invited) United Kingdom Applied Computational *Electromagnetics Symposium*, London, England, December 2000.

- Staker, S., <u>M. Piket-May</u>, C. Holloway, "An Algorithm Study of the Alternating Direction Implicit (ADI) FDTD Technique", *National Academies of Sciences and Engineering Radio Science*, Boulder, CO, January 2001.
- Fornberg, P., A. Byers, S. Harmon, <u>M. Piket-May</u> "FDTD, Modeling of Printed Circuit Board Signal Integrity and Radiation ", *National Academies of Sciences and Engineering Radio Science*, Boulder, CO, January 2001.
- <u>M.J. Piket-May, Piket P.H.</u>, "The Tipping Point in Gender Studies", 1 hour, *Achieving Success in Academia Symposia*, University of Colorado System, March 6, 2009.
- <u>M.J. Piket-May</u> "Negotiating at an Uneven Table: Developing Moral Courage in Resolving Our Conflicts", *Diversity Summit*, 2 hours, University of Colorado at Boulder, November 3, 2009.
- <u>M.J. Piket-May</u> "Lazy Wisdom", *Diversity Summit*, 2 hours, University of Colorado at Boulder, November 3, 2009.
- <u>M.J. Piket-May</u> "Reflections and Critical Thinking", at *Making it Real: Conference on Service Learning and Civic Engagement*, University of Colorado at Boulder, 2009.
- <u>M.J. Piket-May</u>"Negotiating at an Uneven Table: Developing Moral Courage in Resolving Our Conflicts", *Achieving Success in Academia Symposia*, University of Colorado System, Feb. 26, 2010.
- <u>M.J. Piket-May, Darling, B., Miranda</u>, "Women Don't Ask", 1.5 hour, *Diversity Summit*, University of Colorado at Boulder, November 2, 2010.
- <u>M.J. Piket-May, Piket P.H.</u>, "The Tipping Point in Diversity Studies", 1.5 hour, *Diversity Summit*, University of Colorado at Boulder, November 3, 2010.
- <u>M.J. Piket-May</u> et. al. "Women Don't Ask ", *Achieving Success in Academia Symposia*, University of Colorado System, February 25, 2011.
- <u>A. Andrews and M.J. Piket-May</u>, "Building Community through Collaboration", invited paper, Coleman Conference, 2013.
- <u>Ravi C. Bollimuntha</u>, Mohammed F. Hadi, Melinda J. Piket-May, and Atef Z. Elsherbeni, "Separation of Electric and Magnetic Surface Currents in Equivalent EM Problems", *Proceedings of the National Radio Science Meeting*, Boulder, Colorado, January 2016.
- <u>Ravi C. Bollimuntha</u>, Mohammed F. Hadi, Melinda J. Piket-May, and Atef Z. Elsherbeni, "Excitation of Plane Waves in Higher Order FDTD Grid", *Proceedings of the National Radio Science Meeting*, Boulder, Colorado, January 2016.
- S. DMello, <u>A. Weiss</u>, M. F. Hadi, M. J. Piket-May, and Atef Z. Elsherbeni, "High Performance Multi-CPU and Multi-GPU Computing of the High-Order FV24 Algorithm", *Proceedings of the National Radio Science Meeting*, Boulder, Colorado, January 2016.
- <u>Sai Ram Anand Vempati</u>, Sunil Sumanth Kollipara, Aleksandr Gafarov, Melinda J. Piket-May, Eric Bogatin, "Determining Accurate ESR values of Ceramic Decoupling Capacitors, *Proceedings of the National Radio Science Meeting*, Boulder, Colorado, January 2016.
- <u>Mohammed F. Hadi</u>, Melinda J. Piket-May, S. Mahmoud and Atef Z. Elsherbeni, "Dispersion Relation for Cylindrical FDTD Grids", *Proceedings of the National Radio Science Meeting*, Boulder, Colorado, Jan 2016.
- <u>Chun-Ting "Tim" Wang Lee</u>, Bill Hargin, Eric Bogatin, and Melinda J. Piket-May "Novel 5X-Line Technique to Extract Copper Conductivity", *Proceedings of the National Radio Science Meeting*, Boulder, Colorado, January 2016.
- <u>Pranav Balachander</u>, Melinda Piket-May and Eric Bogatin, "Analysis of Simulation to Measurement Correlation for PCB Interconnects in HFSS", *Proceedings of the National Radio Science Meeting*, Boulder, Colorado, January 2016.

- <u>A. Weiss</u>, S. DMello, A. Akbar Basha, A. Z. Elsherbeni, M. J. Piket-May, and M. F. Hadi, "Enhancement of Higher Order FDTD Method Using OpenCL, CUDA, and MPI on Single and Multiple CPUs/GPUs," USNC/URSI National Radio Science Meeting, Boulder, Colorado, January 2017
- R. C. Bollimuntha, <u>J. Diener</u>, M. F. Hadi, M. J. Piket-May, and A. Z. Elsherbeni, "Ogive Modeling with Conformal Standard and Higher-Order FDTD," USNC/URSI National Radio Science Meeting, Boulder, Colorado, January 2017
- <u>R. C. Bollimuntha</u>, V. D. Paladugu, R. Saha, M. J. Piket-May, A. Z. Elsherbeni, and M. F. Hadi, "Fiber Glass-Weave Skew Analysis using the Finite-Difference Time-Domain Method," USNC/URSI National Radio Science Meeting, Boulder, Colorado, January 2017
- R. C. Bollimuntha, V. D. Paladugu, R. Saha, M. J. Piket-May, A. Z. Elsherbeni, and M. F. Hadi, "Fiber Glass-Weave Skew Analysis using the Finite-Difference Time-Domain Method," USNC/URSI National Radio Science Meeting, Boulder, Colorado, January 2017
- A. Weiss, S. DMello, A. Z. Elsherbeni, M. J. Piket-May, and M. F. Hadi, "Enhancement of Higher Order FDTD Method Using OpenCL, CUDA, and MPI on Single and Multiple CPUs/GPUs," USNC/URSI National Radio Science Meeting, Boulder, Colorado, January 2017
- "Community Collaboration for Assistive Technology Design", 45 minute INVITED TALK, Coleman Conference, November 2017, Superior, CO.
- M. F. Hadi, A. Z. Elsherbeni, Ravi C. Bollimuntha and Melinda J. Piket-May, "Reflection Analysis of Spherical FDTD Absorbing Boundary Conditions," 2018 IEEE International Symposium on Antennas and Propagation and USNC-URSI Radio Science Meeting, Boston, MA, July 2018
- R. C. Bollimuntha, M. F. Hadi, M. J. Piket-May, and A. Z. Elsherbeni, "Spherical FDTD Numerical Dispersion Analysis," USNC/URSI National Radio Science Meeting, Boulder, Colorado, January 2018
- N. Sonth, R. C. Bollimuntha, M. F. Hadi, M. J. Piket-May, and A. Z. Elsherbeni, "A Finite Volumes-Based FDTD Material Dispersion Modeling," USNC/URSI National Radio Science Meeting, Boulder, Colorado, January 2018
- M. Piket-May, "Learning Unlimited" Keynote Speaker for 2-day Teaching and Learning Conference in Colorado Springs 2020

COURSES

GEEN1400 Freshman Projects (Spring and Fall since 1994)

A design section for the first year projects course that is a part of the Integrated Teaching and Learning Lab Program. This section topic is service learning, often in the area of assistive technology. The student teams do an open ended project for a specific client in our local community who has a specific need. There have also been students that do community outreach to zoos, museums and classrooms.

ECEN1100 ECE Freshman Seminar; Exploring ECE

Helped develop this course and occasionally teach this introduction to Electrical Engineering seminar.

ECEN1400 ECE Introduction to Analog and Digital Design (Fall 2021 - ongoing)

Re-developed and teach this introduction to analog and digital device course through focusing on service learning, in the area of assistive technology. The student teams complete a final open-ended project for a specific client in the community.

ECEN3400 Electromagnetic Fields and Waves

This is a core class in electromagnetics. It has a 3-hour lecture, 2-hour recitation, and 2-hour lab each week. It teaches traditional material in a collaborative style. Students write reports and observations about electromagnetics in addition to the traditional problem solving work. Students also have to do an open ended design project at the end of the semester, pushing their knowledge of EM beyond that of the basic material. Students do in class presentations and write up a final report.

ECEN3410 Electromagnetic Waves and Transmission

Traditional information is experienced in an active learning classroom. The students work in teams and collaborative learning exercises are used to enhance the student's absorption of the material. Students write observations about EM and do a final open-ended design project using LC, an FDTD EM simulation tool.

ECEN3030 Circuits for Non-majors

Basic Circuit Analysis for non-electrical engineering students.

ECEN 4024/5024 Time Domain/Numerical Techniques

Theoretical development of the Finite Difference Time Domain Technique and open ended design projects using FDTD for a real world problems.

ECEN 5154 Computational Electromagnetics

Provides a computational study of microwave circuits and antennas, using finite-difference, finite-element, and moment methods. Requires students to develop algorithms, write and execute programs, and prepare reports analyzing results. Circuits include waveguides, microstrip lines, and center-fed dipole antennas.

ECEN 4224/5224 High Speed Digital Design

High Speed Digital Design (HSDD) from a practical standpoint. Students learn basic theory of HSDD, monitor the Signal Integrity industrial list, and do open ended projects.

ECEN 4324/5324 Micro-System Packaging

High speed packaging from a practical standpoint. High speed systems must be packaged to obtain a robust final design. Mechanical and electrical concepts are taught in relation to each other.

ECEN 5414 Essential Principles of Signal Integrity

How interconnects affect signal integrity.

ECEN 5434 S-Parameters for Signal Integrity

How S-parameters are used in signal integrity. Piket-May

POST DOCTORAL RESEARCHERS

Eric Thiele; Wright Patterson Air Force Research Center; Ball Aerospace

Julie Chang; Higher Education for Electrical Engnieering

GRADUATE STUDENTS

Mohammed Hadi (PhD May 1996), Professor at the University of Kuwait, Modeling Long Distance Propagation using a 2D Modified (2,4) FD-TD scheme.

Linden McClure (PhD May 1996), Engineer at HP: Colorado Memory Systems, Space Grant Project - COTS/ SEU/ Fault Tolerance.

Gary Haussmann (MS EE 1995, PhD May 1998), EMC Engineer Silicon Graphics, Mountain View, California, Cray Research Intern (Summer 1995, Summer 1997) Modeling Long Distance Propagation using a 3D Modified (2,4) FD-TD Scheme.

Todd Marshall (MS Thesis EE December 1996) Continued on for a PhD with Z. Popovic in Antenna Design, National Renewable Energy Lab (NREL) Research Assistant 1995 Computational EM Modeling of Solar Cells using a Modified FD-TD Scheme.

Jason Mix (MS Thesis EE June 1995, PhD January 1999), Design Engineer at Intel, Cray Research Intern (Summer 1994), Motorola Intern (Summer 1995), Intel Intern (Summer/Fall 1997) Modeling High Speed Phenomena using FD-TD.

Zale Schoenborn (MS Thesis EE December 1996), Design Engineer at Intel, Computational EM modeling of High-Speed Digital Design for MCM's. Deutsch Bank

David Smith (MS Thesis EE Dec 95), Continuing on for a PhD in Remote Sensing at CU, EM Analysis of EMP.

Keith Kelly (PhD Aug 2000), Engineer at Ball Aerospace, Research Area: Microwave Photonic Band Gap Structures. First RF

Bryan Boots (MS May 1999) Intern at Ball, Summer 1999, Intern at Cray Research, Summer 1998, Research Area: Power/Ground Design for High Speed Systems; working at Ansoft, Ansys.

Ted Brannan (MS EE May 1999) FDTD modeling for Optical Resonators.

Andrew Byers (MS Thesis May 2000) Intern at Intel, Summer 1998, 99 Research Area: High Speed Digital Design; working at Textronix; working for Ansoft/Ansys.

Shawn Staker (MS Thesis August 2000) Research Area; Higher Order FDTD Schemes; working at Lincoln Lab.

Pelle Fornberg (MS Thesis December 2001) EMC; working at Intel.

Billy Mansour (MS May 2002) High Speed Interconnects; working at Pico-second.

Steve Hall (MS May 2002) High Speed Interconnects; working at Pico-second.

Paul Vichot (MS EE May 1995 PhD May 2002) Engineer at Applied Physics Lab, Washington, DC Modeling High Speed Digital Design.

Ian Rumsey (MS Thesis EE May 1999, PhD May 2002) Intern at Ball Aerospace, Summer 1998 Research Area: Antenna Design with PBG substrates; Hybrid FDTD / S-parameter.

Sirichia Kungswai (MS Thesis May 2002) High Speed Packaging. Kyocera

Todd Lammers (MS Thesis June 2003) High Speed Routing EM Simulation. Seagate

Alpesh Bhobe (MS Thesis EE December 1999, PhD December 2003) ADI Finite Difference Time Domain Methods for Anechoic Chambers. Cisco

Mohamed Mohamed (PhD June 2004) Theoretical Meta Material Design.

Mona Elhelbawy (PhD May 2005) 3-D Cylindrical ADI FDTD Method. NIST, various professor positions

Seyit Tigrek (PhD May 2012) Teaching Smartphone and Microcontroller Systems using "Android Java".

Sanjay DeMello (MS December 2013) Massively Parallel Computing for a 4th order FDTD algorithm. Apple

Vinit Vyas (MS December 2014) Fortran CUDA programming for FDTD core using GPU's

Pranav Balachander (MS December 2015) Analysis of Simulation to Measurement Correlation for PCB Interconnects in HFSS

Sai Vempati (MS December 2015) Determining Accurate ESR values of Ceramic Decoupling Capacitors

Rohit Kandurwar (MS December 2015) OpenCL programming to maximize big computing for EM using Graphical Processing Units

Ashik Imran Akbar Basha (MS May 2016) OpenCL programming to maximize big computing for EM using Graphical Processing Units

Ravi Chandra Bollimuntha (PhD 2018) MV(2,4) Domain Decomposition FDTD, Apple

Neeti Soonth (MS May 2018) Higher order FDTD with Dispersion, Apple

Chun-Ting Wang Lee (PhD December 2020) "Test Structures and Economical Non-destructive Measurement Techniques for Multilayer Printed Circuit Board Impedance Characterization" Keysight

Fadi Deek (PhD January 2021) "Analyzing and Reducing Signal to Cavity Coupling in PCBs and Packages for Digital and Mixed Signal Applications", Siemens, AMD

Chaithra Suresh (MS Dec 2022) Apple Michelle Christian (MS Dec 2022) Aakriti Srivastava (MS Thesis May 2023) Qorvo Vivek Kamble (MS Dec 2023) AMD, NVidea Neha Pazare (MS Dec 2023) NIST, Apple, AMD Rylee Beach (MS Dec 2023) HSDE Aditya Rao, (MS Thesis May 2021, PhD Dec 2024) Qualcomm Ameya Ramadurgakar (PhD Dec 2024) NIST Saish Sawant (MS Dec 2021, PhD May 2026) Keysight Mohammed Farhan Ahmed (PhD May 2026) Ansys

SELECT UNDERGRADUATE RESEARCH STUDENTS

Aaron Orsen; Signal Integrity Taylor Colety; Near Field Antennas Ginn Sato; Assistive Technology Ainsley Herd; Microcontrollers Elia Muncey; Microcontrollers Piket-May Sonal Tamrakar; Slammer Circuits to measure low ESR capacitors

William Guanci; Microcontrollers

Matthew Cerza; Microcontrollers

Brooke Cochran; Engineering Education; Postsecondary Education Recruiting

Marina McCann; Engineering Education; Postsecondary Education Recruiting

Fallyn Logan; Engineering Education; Assistive Technology;" Engaging Youth Through Interactive Storybooks "

Mohammed Al Hasani; Signal Integrity: Simulated and Fabricated PCB

Garrett Gipson; Assistive Technology

Hugo Stetz; Supercomputing

Kristin Bogar; Assistive Technology Design

Brandon Hernandez; Alexa Assistive Technology Design

Anna Anderson; High Performance Computing

Bennett; High Performance Computing

Vincent Mahathirash; High Performance Computing for Electromagnetic Behavior

Alec Weiss; Visual Simulation of Electromagnetic Behavior

Ryan Smith; Graphical User Interface for Massively Parallel Computing for a 4thorder FDTD algorithm

Chris Lasek; Photonic Bandgap Structures

Scott Harmon; EMC for Networking with Cisco

Asa Holley; FDTD/S-parameter Study

Jennifer Masini; General Electromagnetics/ Web development/Coding, MEMS

Janice Huang; 3D Electromagnetic Interactions with the Human Retinal Rod, Photonic Band Gap Structures, biomed studies

Todd Lammers; Photonic Band Gap Structures;

College of Engineering (CEAS) Outstanding Undergraduate Research Award recipient

Ted Kutrumbos; Photonic Bandgap Structures for RF Applications & EMC for Networking with Cisco

Ted Brannan; Designing Optical Resonators with FDTD/ High Performance Computing

Pelle Fornberg; High Speed Digital Design with Intel

David Schmeltzer; High Speed Interconnect Design with Kyocera

Billy Mansour; Electrical MEMS Design

Tom Hamilton; MEMS Design

Mike Niyompong; Photonic Bandgap Structures / Neural Nets

Lindsay Wanner; Co-Planar Photonic Bandgap Structures

Matt Larson; Coplanar Waveguides

Andy Byers; High Speed Design

Bryan Boots; Power/Ground Systems for High Speed Design

Ian Rumsey; Photonic Bandgap Structures; **CEAS Outstanding Undergraduate Research Award recipient** Piket-May David Dunshee; SPICE/FD-TD Interface Darrell Barnhart; Macro Parameter Characterization of Complex High Speed Structures Jody Matsushima; SPICE/ FD-TD Interface Curtis Nottberg; Supercomputer Simulations Tim Stelzer; Assistive Technology

DIRECT FUNDING

National Science Foundation CAREER Award

Computational Electromagnetic Studies of High Speed Design \$210,000

Research Experience for Undergraduates \$40,000

NSF CAREER Industrial Matching from Intel Contract \$75,000

ARPA Device Optimization Program

Subcontract from Cray Research Full Wave Analysis of Electromagnetic Fields \$100,000

Department of Defense

Superconducting Multichip Module \$365,000

Intel

High Speed Design for Printed Circuit Boards \$105,000

Cisco

High Speed Design for Printed Circuit Boards \$60,000

Ansys

Development of a High-Speed Digital Engineering (HSDE) Professional Master's Program (PMP) \$100,000, \$50,000, \$23,000

Keysight

with Eric Bogatin High-Speed Digital Engineering (HSDE) \$7,5000

Siemen's

with Eric Bogatin High-Speed Digital Engineering (HSDE) Labs \$42,000

GE Medical Systems

with Eric Bogatin High-Speed Digital Engineering (HSDE)\$20,000 Averatek with Eric Bogatin High-Speed Digital Engineering (HSDE)\$10,000

Kyocera - AVX with Eric Bogatin High-Speed Digital Engineering (HSDE)\$10,000

Kyocera Design of High Speed Connectors for Kyocera \$130,000

Jet Propulsion Lab Director's Discretionary Funds Award

Miniature High Frequency Electronic Packaging Technology \$10,000

ROME Air Force Research Lab

Electromagnetic Electromigration Study \$20,000

NSF Academic Research Infrastructure Program

Instrumentation for Wireless Multi-Media High-Speed Communications PI; Popovic, Co-PI; Piket-May, Varenasi, Mathys \$500,000

University of Colorado Integrated Teaching and Learning Lab

First Year Engineering Design Projects Curriculum Development \$14,166

University of Colorado Undergraduate Excellence Fund

Introduction to Academia; A Retention Program for First Year Engineers \$9,000

Lemelson/MIT National Center for Innovation and Invention in Academia

First Year Engineering Design Swing Project Commercialization \$10,500

University of Colorado Council on Research and Creative Work Award Full Wave Analysis of EM Fields for High Speed Design \$5,000

CU MIMICAD Center funding

Signal Integrity Study \$5,000

Hughes Undergraduate Biomedical Initiative

Hyperthermia Studies Using FDTD, EM Studies of the Human Retinal Rod \$4,000

Lemelson/MIT National Center for Innovation and Invention in Academia First Year Engineering Design Curriculum Development

\$2,000 Piket-May

CU CampMODE Center funding

Design of transmission Line MicroElectroMechanical Systems (MEMS) for Undergraduate Labs \$10,000

University of Colorado Service Learning Grant

Support for Community Outreach in Assistive Technology \$1,000

University of Colorado CIRTL Grant Assessment of Service Based Learning \$4,000

BOLD Fellowship \$20,000

Engage Fellowship \$3,000

CU LEAP Grant \$3000

University of Colorado Undergraduate Research Opportunity (DLA/SURF)* ongoing High Speed Interconnect Design, Signal Integrity, Assistive Technology Design, Supercomputing \$1,500 per student – every year

University of Colorado Undergraduate Research Opportunity (UROP)* ongoing High Speed Interconnect Design, Signal Integrity, Assistive Technology Design, Supercomputing \$1,500 per student – every year

IN KIND FUNDING

Cray Research Supercomputer Accounts for Piket-May and all students (1993-2003) (10 years over \$10,000,000 indirect cost funding)

Cray Research Donation 2 GPU's for Parallel computing analysis (~\$50,000)

Intel Donation 3 high end PC's (~\$30,000)

Silicon Graphics donation 4 high performance workstations (~\$50,000/each)

Electromagnetic Computer Simulation Tools

(Polar Instruments, Seimens - Hyperlynx, Keysight - ADS, ANSYS - HFSS, Remcon - XFDTD)