Brian MacKie-Mason <brimacki@unm.edu>

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OBJECTIVE

Seeking a postdoctoral appointment to further my career in scientific research.

EDUCATION

Doctoral Candidate Electrical Engineering   *Expected 2017*
University of New Mexico
<u>**Advisor:**</u> **Professor Zhen Peng**

MS Nuclear Engineering   *2013*
University of Wisconsin-Madison

BSE Nuclear Engineering   *2011*
University of Michigan

PUBLICATIONS

1. **B. MacKie-Mason**, A. Greenwood, and Z. Peng, "Adaptive and parallel surface integral equation solvers for very large-scale electromagnetic modeling and simulation (invited paper)," *PIER,* **154**, 143 (2015).
2. Z. Peng and **B. MacKie-Mason**, "High-Performance Surface Integral Equation Solvers Towards Extreme-Scale Electromagnetic Modeling and Simulation," *IEEE ACES,* Honolulu, HI, March 2016.
3. Z. Peng, R. Hiptmair, Y. Shao, **B. MacKie-Mason**, "Domain Decomposition Preconditioning for Surface Integral Equations in Solving Challenging Electromagnetic Scattering Problems," *IEEE TAP,* **64**, 210 (2016).
4. **B. MacKie-Mason**, Z. Peng, "Adaptive, Scalable Domain Decomposition Methods for Surface Integral Equations," *IEEE AP-S,* Vancouver, B.C., July 2015.
5. Z. Peng, **B. MacKie-Mason**, "Integral equation discontinuous Galerkin methods for time harmonic electromagnetic wave problems," *IEEE ACES,* Williamsburg, VA, March 2015.

TALKS/PRESENTATIONS

1. **B. MacKie-Mason** and Z. Peng, "High-fidelity, High-performance Integral Equation Solver for Time-Harmonic Maxwell's Equations", *IEEE AP-S,* Fajardo, Puerto Rico, U.S.A., June 2016.
2. **B. MacKie-Mason** and Zhen Peng, "Towards a Real-Time Solution of Extreme-Scale Electromagnetic Problems", *USNC-URSI NRSM,* Boulder, CO, U.S.A., January 2017 (submitted).
3. **B. MacKie-Mason**, Z. Peng, and C. Kung, "Extreme Fidelity Computational Electromagnetic Analysis in the Supercomputer Era", *IEEE SC16,* Salt Lake City, Utah, U.S.A., November 2016.
4. **B. MacKie-Mason** and Z. Peng, "Adaptive and parallel surface integral equation solvers for very large-scale electromagnetic modeling and simulation," *ECE Student Paper Competition,* Albuquerque, NM, April 2016.
5. **B. MacKie-Mason**, W. Tang, "Modeling of laser-induced field emission", *Air Force Research Lab Annual Scholar Presentation,* Albuquerque, NM, July 2013.
6. **B. MacKie-Mason**, N. Lockwood, W. Tang, "Development of single-walled nanotube fiber cathode diagnostics", *Air Force Research Lab Annual Scholar Presentation,* Albuquerque, NM, July 2012.

7. **B. MacKie-Mason**, A. Greenwood, N. Lockwood, "Automated Testing of ICEPIC", *Air Force Research Lab Annual Scholar Presentation,* Albuquerque, NM, July 2011.

TECHNICAL SKILLS

- Algorithm Development, Parallel Computing, Electromagnetic Analysis, MPI, OpenMP, Domain Decomposition Methods, Surface Integral Equation Methods, College Instruction, Scientific Computing
- Languages: C++, MATLAB, Bash shell, Python, C
- Software Packages: ViSiT, CUBIT, KDevelop, SolidWorks (CAD), Improved Concurrent Electromagnetic Particle-in-Cell (ICEPIC)

PROFESSIONAL EXPERIENCE

Research Assistant   *August 2013 - Present*
Department of Electrical Engineering, University of New Mexico
Prof. Zhen Peng
Computational Electromagnetics
- Researched and developed a geometry-aware domain decomposition (GA-IE-DDM) method for the integral solution to extreme-scale, multi-scale electromagnetics problems.
- Developed tools to automatically partition mesh files for GA-IE-DDM utilizing a k-way graph partitioning code and creating a global-to-local mapping scheme.
- Parallelized GA-IE-DDM in distributed memory environment for a scalable solution method to the Electric Field Integral Equation.

Research Assistant   *Summers 2011-13*
Air Force Research Lab, Kirtland AFB
Drs. Wilkin Tang, Nathaniel Lockwood & Andrew Greenwood
Computational Electromagnetics
- Studied the effects of laser-induced field emission (2013).
- Designed diagnostics to improve the study of field emission (2012).
- Designed validation and verification test suite for ICEPIC (2011).
- Security clearance expiring 2022.

AWARDS & HONORS

- ECE GSA Student Paper Competition – Journal Paper Section, 3rd prize, April 2016.
- Eagle Scout, February 2007

DEPARTMENTAL SERVICE

UNM GPSA   *Fall 2015 - Present*
- Department of ECE Delegate (August 2015 - May 2016, August 2016 - Present)
- GPSA Finance Committee Member (August 2016 - Present)
- GPSA Representative to Information Technology Committee (August 2015 - May 2016)
- Legislative Steering Committee Member-at-large (February 2016 - May 2016)

ECE GSA   *Fall 2015 - Present*
- ECE GSA Vice-President (June 2016 - Present)