Brian MacKie-Mason <brimacki@unm.edu>
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EDUCATION

Doctoral Candidate Electrical Engineering — *Expected 2017*
University of New Mexico, **Advisor**: Professor Zhen Peng — *GPA: 3.95/4.00*

Master of Science Nuclear Engineering — *2013*
University of Wisconsin-Madison

Bachelor of Science in Engineering Nuclear Engineering — *2011*
University of Michigan

PUBLICATIONS

1. **B. MacKie-Mason**, Y. Shao, and Z. Peng, "Full-Wave Channel Modeling in Urban Environments for Wireless Communication," (working).
2. **B. MacKie-Mason**, H-W. Gao, and Z. Peng, "Rapid Antenna Prototyping on Large Platforms via Data-Sparse Schur Complement," (working).
3. **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).
4. **B. MacKie-Mason** and Z. Peng, "Towards Real-time In-Situ Antenna Analysis and Design on Platforms of 1000 Wavelengths", *IEEE AP-S,* San Diego, CA, July 2017.
5. 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.
6. 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).
7. **B. MacKie-Mason**, Z. Peng, "Adaptive, Scalable Domain Decomposition Methods for Surface Integral Equations," *IEEE AP-S,* Vancouver, B.C., July 2015.
8. 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 Zhen Peng, "Towards a Real-Time Solution of Extreme-Scale Electromagnetic Problems", *USNC-URSI NRSM,* Boulder, CO, U.S.A., January 2017.
2. **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.
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.

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

Postdoctoral Appointee *March 2018 - present*
Leadership Computing Facility, Argonne National Laboratory

- Provide high performance computational expertise to project.

Research Assistant *August 2013 - Present*
Department of Electrical Engineering, University of New Mexico
Prof. Zhen Peng

- 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.
- Developed a model order reduction technique for solving electromagnetic radiation problems when M antennas are mounted on very large PEC platforms.

Research Assistant *Summers 2011-13*
Air Force Research Lab, Kirtland AFB
Drs. Wilkin Tang, Nathaniel Lockwood & Andrew Greenwood

- Studied the effects of laser-induced field emission (2013), designed diagnostics to improve the study of field emission (2012), and designed validation and verification test suite for ICEPIC (2011).
- Security clearance active through 2022.

AWARDS & HONORS

- UNM Leadership and Involvement Award, 2018.
- GPSA President's Award for Innovative Leadership, 2017.
- ECE Outstanding Graduate Student, 2017.
- ECE Graduate Student Association Student Paper Competition – Journal Paper Section, 3rd prize, 2016.
- Eagle Scout, February 2007

DEPARTMENTAL SERVICE

UNM GPSA *Fall 2015 - Present*

- Graduate & Professional Student Association (GPSA) Alternate Representative to Student Fee Review Board (July 2017 - Present)
- Department of ECE Delegate (August 2015 - May 2016, August 2016 - May 2017)
- GPSA Finance Committee Member (August 2016 - May 2017)
- GPSA Representative to Information Technology Use Committee (August 2015 - May 2016)

- Legislative Steering Committee Member-at-large (February 2016 - May 2016)

ECE Graduate Student Association (GSA) *Fall 2015 - Spring 2017*

- ECE GSA Vice-President (June 2016 - May 2017)