

IMAM AL RAZI

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EDUCATION

Ph.D. Computer Engineering, August 2022
University of Arkansas, Fayetteville, AR

BS Electrical and Electronic Engineering (EEE), March 2016
Bangladesh University of Engineering and Technology, Bangladesh

DISSERTATION

Title Constraint-Aware, Scalable, and Efficient Algorithms for Multi-Chip Power Module Layout Optimization

Research Focus

- CAD tool development for Power Electronic Design Automation

Supervisor Dr. Yarui Peng

RESEARCH & WORK EXPERIENCE

- **EDA Tools Software Engineer, Intel Corp.**
US, Oregon, Hillsboro

From September 06, 2022 to Present

- Working on development of an automated tool flow for chip design.
- Developing & implementing algorithms for chip design automation.

- **Graduate Research Assistant, Energy-Efficient Electronics and Design Automation (E³DA) Lab, University of Arkansas**

From August 2017 to August 2022

- Working on development of an automated layout engine for power modules.
- Developing & implementing algorithms for power module layout optimization.

- **Lecturer, Dept.of EEE, Daffodil International University, Bangladesh**

April 2016 to July 2017

- Conducted courses on Electrical Circuits, Electronics.
- Conducted sessionals on Electrical Machines, Circuit Simulation.
- Got "Excellent" remark on the survey of performance by students.

PUBLICATIONS

Publication Summary

- **15 Published papers**
 - 6 conference papers as the first author
 - 1 journal paper as the first author
 - 5 co-authored conference papers
 - 3 co-authored journal paper
- **1 Journal under review (as the first author)**
- **107 Total Citations**

List of Publications as the First Author

- 1 . Imam Al Razi, Whit Vinson, David Huitink, and Yarui Peng, "[Electromigration-Aware Reliability Optimization of MCPCB Layouts Using PowerSynth](#)", in Proc. IEEE Energy Conversion Congress and Exposition, 2022. (Accepted for Publication Conference Paper)
- 2 . Imam Al Razi, Quang Le, Tristan Evans, Shilpi Mukherjee, H. Alan Mantooth, and Yarui Peng, "[PowerSynth Design Automation Flow for Hierarchical and Heterogeneous 2.5D Multi-Chip Power Modules](#)", IEEE Transactions on Power Electronics, vol. 36, no. 8, pp. 8919–8933, 2021. (Published Journal Paper)
- 3 . Imam Al Razi, Quang Le, H. Alan Mantooth, and Yarui Peng, "[Hierarchical Layout Synthesis and Optimization Framework for High-Density Power Module Design Automation](#)", in Proc. International Conference on Computer-Aided Design, pp. 1-8, Nov 2021. (Published Conference Paper)
- 4 . Imam Al Razi, David Huitink, and Yarui Peng, "[PowerSynth-Guided Reliability Optimization of Multi-Chip Power Module](#)", in Proc. IEEE Applied Power Electronics Conference, pp. 1516-1523, Jun 2021. (Published Conference Paper)
- 5 . Imam Al Razi, Quang Le, H. Alan Mantooth, and Yarui Peng, "[Physical Design Automation for High-Density 3D Power Module Layout Synthesis and Optimization](#)", in Proc. IEEE Energy Conversion Congress and Exposition, pp. 1984–1991, Oct 2020. (Published Conference Paper)
- 6 . Imam Al Razi, Quang Le, H. Alan Mantooth, and Yarui Peng, "[Hierarchical Layout Synthesis and Design Automation for 2.5D Heterogeneous Multi-Chip Power Modules](#)", in Proc. IEEE Energy Conversion Congress and Exposition, pp. 2257–2263, Sep 2019. (Published Conference Paper)
- 7 . Imam Al Razi, Quang Le, H. Alan Mantooth, and Yarui Peng, "[Constraint-Aware Algorithms for Heterogeneous Power Module Layout Synthesis and Optimization in PowerSynth](#)", in Proc. IEEE Workshop on Wide Bandgap Power Devices and Applications, pp. 323–330, Oct 2018. (Published Conference Paper)

List of Publications as a Co-Author

- 1 . David Huitink, Whit Vinson, Collin Ruby, Imam Al Razi, and Yarui Peng, "[Factoring Interacting Stress Mechanisms in Design for Reliability of Extreme Environment Power Modules](#)", (accepted) in Proc. IEEE Workshop on Wide Bandgap Power Devices and Applications, 2022. (Accepted for Publication Conference Paper)
- 2 . Q. Le, I. A. Razi, T. M. Evans, S. Mukherjee, Y. Peng and H. Alan Mantooth, "[Fast and Accurate Parasitic Extraction in Multichip Power Module Design Automation Considering Eddy-Current Losses](#)," in IEEE Journal of Emerging and Selected Topics in Power Electronics, doi: 10.1109/JESTPE.2022.3175150. (Published Journal Paper)
- 3 . Yarui Peng, Quang Le, Imam Al Razi, Shilpi Mukherjee, Tristan Evans, and H. Alan Mantooth, "[PowerSynth Progression on Layout Optimization for Reliability and Signal Integrity](#)", IEICE Nonlinear Theory and Its Applications, vol. 11, no. 2, pp. 124–144, Apr 2020. (Published Journal Paper)
- 4 . Tristan Evans, Quang Le, Shilpi Mukherjee, Imam Al Razi, Tom Vrotsos, Yarui Peng, and H. Alan Mantooth, "[Powersynth: A Power Module Layout Generation Tool](#)", IEEE Transactions on Power Electronics, vol. 34, no. 6, pp. 5063–5078, Jun 2019, Highlighted Paper. (Published Journal Paper)

- 5 . Joshua Mitchener, Imam Al Razi, and Yarui Peng, “Designing a Graphical User Interface for the Power Module Optimization Tool PowerSynth”, in Proc. ASEE Midwest Section Conference, 2021. (Accepted for Publication Conference Paper)
- 6 . Quang Le, Imam Al Razi, Yarui Peng, and H. Alan Mantooth, “PowerSynth Integrated CAD Flow for High Density Power Modules”, in Proc. IEEE Design Methodologies Conference, pp. 1-6, Jul 2021. (Published Conference Paper)
- 7 . Quang Le, Imam Al Razi, Yarui Peng, and H. Alan Mantooth, “Fast and Accurate Inductance Extraction For Power Module Layout Optimization Using Loop-Based Method”, in Proc. IEEE Energy Conversion Congress and Exposition, 2021 (Accepted for Publication Conference Paper)
- 8 . Bakhtiyar Md Nafis, Ange Iradukunda, Imam Al Razi, David Huitink, and Yarui Peng, “System-level Thermal Management and Reliability of Automotive Electronics: Goals and Opportunities in the Next Generation of Electric and Hybrid Electric Vehicles”, in Proc. ASME International Technical Conference and Exhibition on Packaging and Integration of Electronic and Photonic Microsystems, pp. 1–8, Oct 2019. (Published Conference Paper)

List of Publications under Review

- 1 . Imam Al Razi, Quang Le, Tristan Evans, H. Alan Mantooth, and Yarui Peng, “PowerSynth 2: Physical Design Automation for High-Density 3D Multi-Chip Power Modules,” (under review) in in IEEE Transactions of Power Electronics.

Reviewer Reviewed papers for IEEE Energy Conversion Congress and Expo (ECCE) – 2020, 2021, 2022.
Reviewed papers for Applied Power Electronics Conference (APEC)– 2022

Google Scholar Link <https://scholar.google.com/citations?user=XYRkhWAAAAAJ&hl=en>

TECHNICAL SKILLS

Programming Languages	C/C++, Python, MATLAB, Assembly.
Computer aided design	AutoCAD, Cadence-Virtuoso, Innovus, Calibre, Design Compiler, Primitime
Circuit Simulator	PSPICE, LTSPICE, HSPICE
Frameworks and Tools	Git, Latex, PyTorch, ANSYS Q3D, Workbench, SolidWorks.
Operating Systems	Windows, Linux.

SYNERGISTIC ACTIVITIES

- ◆ Treasurer, Bangladesh Student Organization, University of Arkansas
- ◆ Webinar and IT coordinator, Student Leadership council, POETS-ERC.

AWARDS & GRANTS

- ◆ Graduate School Travel Grant for ECCE 2019, DAC 2022
- ◆ SIGDA University Demonstration Travel Grant at Design Automation Conference (DAC) 2022
- ◆ 100-for-100 Scholarship from MSCAD Lab, University of Arkansas
- ◆ First Place Award in ECCE Student Project Demo Competition 2021

RELEVANT COURSE WORKS

- ♦ Algorithms
- ♦ Deep Learning
- ♦ Machine Learning
- ♦ Computer Architecture
- ♦ Advanced Digital Design
- ♦ Database Management Systems
- ♦ Embedded Systems
- ♦ Design Automation of VLSI Circuits and Systems

REFERENCE

Dr. Yarui Peng
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University of Arkansas, Fayetteville, AR, USA
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Dr. Alan Mantooth,
Distinguished Professor, The Twenty-
First Century Research Leadership Chair
in Engineering
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