Peyman Dehghanzadeh
1889 Museum Road
Gainesville, FL 32611
(334) 444-7744
p.dehghanzadeh@ufl.edu
February 15, 2025

Hiring Committee Chair
Department of Electrical Engineering
University of Alabama in Huntsville
301 Sparkman Drive
Huntsville, AL 35899

Dear Hiring Committee,

I am writing to express my strong interest in the tenure-track Assistant Professor position in Electrical Engineering at University of Alabama in Huntsville (UAH). Currently, I am a **Postdoctoral Researcher** at the University of Florida, specializing in Analog and Digital IC Design, RFIC Design, Compute-in-Memory (CiM), and Hardware Security. I am excited to bring my passion for innovative research, interdisciplinary collaboration, and impactful teaching to your department, driving both academic excellence and a culture of discovery.

Throughout my research career, I have contributed to **ten peer-reviewed papers**—seven published in prestigious journals and three under review—and secured **three US patents** and submitted another two invention disclosures through the University of Florida. My research spans multiple areas, including the development of LUNA CiM, a programmable Compute-in-Memory fabric for neural network acceleration, as well as the design of MM-PUF and MBM-PUF to minimize die area overhead while integrating security primitives into edge intelligence systems. Additionally, my work in RF and RFIC design includes a publication on reducing self-interference for MIMO communication systems, and I have proposed the use of distributed batteries in 3D ICs to enhance efficiency and thermal management.

Looking ahead, my ongoing research with LUNA CiM has shown promising results, and we are now applying this technique to SIMD applications to enhance computational efficiency. I am also exploring novel approaches in hardware security and integrating advanced CiM technologies into emerging computing paradigms. These efforts align with the department's focus on cutting-edge technologies and present opportunities for impactful contributions.

In teaching, I have instructed VLSI Circuits and Technology 2 and Hands-On Hardware Security for graduate and undergraduate students. In VLSI Circuits and Technology 2, I designed assignments aligned with my research to provide students with practical experience. In the Hands-On Hardware Security course, I taught students various topics in hardware security using a custom board.

My service includes reviewing papers for IEEE TVLSI and various conferences, mentoring graduate and undergraduate students, and serving as Competition Chair for the IoT Student Club, where I promoted IoT among undergraduates.

Attached are my CV, research and teaching statements, and other requested materials. Thank you for considering my application. I look forward to discussing how I can contribute to your team.

Sincerely,

Peyman Dehghanzadeh

Peyman Dehghanzadeh, Ph.D.

Warren B. Nelms Institute for the Connected World

Postdoctoral Researcher at the University of Florida

Department of Electrical & Computer Engineering (ECE)
1889 Museum Road, Gainesville, FL 32611

Phone: +1 (334) 444-7744
Email: p.dehghanzadeh@ufl.edu
LinkedIn: https://www.linkedin.com/in/peyman-d/
Google Scholar: https://scholar.google.com/citations?hl=en&user=MAeZrZcAAAAJ

Professional Summary

I am a Postdoctoral Researcher at the University of Florida with a strong background in Microelectronics Circuits and Systems with specific emphasis on security and intelligence. My research is driven by a commitment to advancing these fields through innovative, interdisciplinary approaches and collaboration with leading experts from industry and academia. I aim to contribute to groundbreaking research in my future faculty position.

Education

Ph.D. 2020 – 2024 **University of Florida, Gainesville, FL, USA**, Electrical and Computer Engineering
Thesis: "Hardware Primitive for Low Power, Low area and High-Speed Edge Intelligence"
Advisor: Professor Swarup Bhunia, IEEE Fellow
Dissertation Committee: S. Bhunia (chair), S. Ray, W. Eisensdadt, and S. Rampazzi

M.S. 2014 – 2016 **Azad University, Esfahan, Iran**, Electrical Engineering-Electronics
Title: "Low Voltage, High Speed Double-Tail Comparators"

B.S. 2002 – 2007 **Azad University, Esfahan, Iran**, Electrical Engineering-Communications

Research Interests

- Analog IC Design
- RF and RFIC Design
- Compute in Memory
- Hardware Security and Trust
- Bioimplantable and Wearable Systems

Research Experience

Aug 2024 – Present **Postdoctoral Researcher,** Warren B. Nelms Institute of the Connected World, University of Florida, Gainesville, FL, USA

Aug 2020 – July 2024 **Graduate Researcher Assistant,** Warren B. Nelms Institute of the Connected World, University of Florida, Gainesville, FL, USA

Teaching Experience

Aug 2023 – Dec 2023 **Graduate Teaching Assistant,** VLSI Circuits and Technology 2
Electrical and Computer Engineering (ECE),
University of Florida, Gainesville, FL, USA

Jan 2024 – May 2024 **Graduate Teaching Assistant,** Hands-On Hardware Security
Electrical and Computer Engineering (ECE),
University of Florida, Gainesville, FL, USA

Industrial Experience

May 2022 – Aug 2022	**Analog Design Intern** Texas Instruments Dallas, TX, USA
Dec 2009 – Jul 2018	**Technical Manager** Faradis Alborz Corporation Esfahan, Iran

Technical Skills

Analog IC
- MOS-Based Amplifiers
- Operation Amplifiers
- Current Mode Amplifiers
- Miller, NM Compensation
- Band Gap Reference, BGR
- Switched Capacitors Circuits
- Gm-C Filters

Digital IC
- Digital Logic Design
- Comput in Memory
- Arithmetic Circuit Design
- Hardware Security primitives
- FPGA-based design
- DACs/ADCs
- HDL, Verilog

RFIC
- LNA
- Mixers
- Oscillators
- VCO
- PLL
- Power Amplifiers
- Synthesizer

Software
- Cadence Spectre
- Cadence Virtuoso
- ADS
- Altium Designer
- Kicad
- LTspice

Publications

Published

- **P. Dehghanzadeh**, A. Madanayake, H. Zhao, S. B. Venkatakrishnan, and S. Mandal, "A Multiport Self-Interference Canceller for Wideband SIMO/MIMO-STAR Full-Duplex Arrays", in *IEEE Transactions on Microwave Theory and Techniques*, vol. 72, pp. 2640 – 2654, 2024. doi: 10.1109/TMTT.2023.3315797.(LinK)
- **P. Dehghanzadeh**, S. Mandal, and S. Bhunia, "MBM-PUF: A Multi-Bit Memory-Based Physical Unclonable Function", in *IEEE Transaction on Circuits and System I*, 2025. doi: 10.1109/TCSI.2025.3526884.(Link)
- **P. Dehghanzadeh**, B. Chatterjee, and S. Bhunia, "LUNA-CIM: Lookup Table based Programmable Neural Processing in Memory", in *IEEE Transaction on Computers*, 2025. doi: 10.1109/TC.2025.3525601(Link)
- **P. Dehghanzadeh**, J. Huan, R. R. Kalavakonda, S. Mandal, and S. Bhunia, "On-Chip Batteries as Distributed Energy Sources in Heterogeneous 3D Integrated Circuits", in *IEEE Access,* vol. 11, pp. 89896-89906, 2023. doi: 10.1109/ACCESS.2023.3305593.(Link)
- J. Huan, **P. Dehghanzadeh**, S. Mandal, and S. Bhunia, "Contact-Less Integrity Verification of Microelectronics Using Near-Field EM Analysis", in *IEEE Access*, vol. 11, pp. 80588-80599, 2023, doi: 10.1109/ACCESS.2023.3300222.(Link)
- T. Kaisar, **P. Dehghanzadeh**, P.X.-L. Feng, and S. Mandal, "Digitally Programmable CMOS Feedback ASIC for Network of Coupled Electromechanical Oscillators", 2023 IEEE International Symposium on Circuits and Systems (ISCAS), Monterey, CA, USA, pp. 1-5, 2023, doi: 10.1109/ISCAS46773.2023.10182172.(Link)
- K. Horace-Herron, **P. Dehghanzadeh**, S. Mandal, and S. Bhunia, "Non-invasive authentication of mail packages using nuclear quadrupole resonance spectroscopy", *Nature, Sci Rep* 13, 5546 ,2023. https://doi.org/10.1038/s41598-023-31497-9.(Link)

Submitted & Under-Review

- **P. Dehghanzadeh**, B. Chatterjee, and S. Bhunia, "Multi-Functional Memory-Based PUF for Distributed Entropy Generation and Storage", in *IEEE Transaction on Very Large Scale Integration (VLSI) systems*, TVLSI.00558.2024.
- O. Sen, C. Ogbogu, **P. Dehghanzadeh**, J. Doppa, S. Bhunia, P. Pande, and B. Chatterjee, "Scalable and Programmable Look-Up Table based Neural Acceleration (LUT-NA) for Extreme Energy Efficiency".
- P. Gaikwad, **P. Dehghanzadeh**, A. Dasgupta, and S. Bhunia "Hardware IP redaction using Programmable Logic Macros"
- R. R. Kalavakonda, J. Huan , **P. Dehghanzadeh**, A. Jaiswal, and S. Bhunia "A Paradigm for Merging Natural and Artificial Intelligence" in *IEEE Internet of Things*, IoT-38348-2024.

Ongoing Research Publications

- **P. Dehghanzadeh**, B. Chatterjee, R. R. Kalavakonda, A. Dasgupta and S. Bhunia, "Pasteable: A Secure On-Body Health Monitoring Platform", 2025 IEEE International Symposium on Circuits and Systems (ISCAS)
- **P. Dehghanzadeh**, B. Chatterjee, and S. Bhunia, "Look-Up Table-Based Computing for SIMD Applications"
- Reiner N. Dizon-Paradis, **P. Dehghanzadeh**, R. R. Kalavakonda, and S. Bhunia, "FITNESS: Feedback-Integrated Pasteables Platform for Tracking and Enhancing Sports Performance"

Patents

Published

- "Look-Up Table-Based In-Memory Computing System", B. Chatterjee, S. Bhunia, and **P. Dehghanzadeh**, US20250028635A1.
- "System And Methods for Distributed Batteries in Integrated Circuits", S. Bhunia and **P. Dehghanzadeh**, US20240234345A1.
- "System And Methods for Programmable Logic Macros", S. Bhunia, **P. Dehghanzadeh**, and G. Gaikwad, US20240232491A1.

Invention Disclosures

- "MBM-PUF: A Multi-Bit Memory-based PUF" S. Bhunia, **P. Dehghanzadeh**, and A. Chatterjee, Tech ID: T19426 (2024).
- "Fusion Intelligence: System and Methods to Combine Natural Intelligence with Artificial Intelligence in IoT Applications", S. Bhunia, **P. Dehghanzadeh**, and J. Huan, Invention ID.: INV-240017, Tech ID.: T19134 (2023).

Ongoing Patent Application

- "Look-Up Table-Based Computing for SIMD Applications" S. Bhunia and **P. Dehghanzadeh**.

Conference Presentations

- **P. Dehghanzadeh**, O. Sen, B. Chatterjee and S. Bhunia, "LUNA-CiM: A Compute-in-Memory Solution for Efficient Neural Processing in IoT Devices", 2nd Warren B. Nelms Annual IoT Conference, December 5 - 6, 2024, Gainesville, FL. ~poster
- **P. Dehghanzadeh**, K. Horace-Herron, M. Naren, and S. Bhunia, "Towards a Handheld Nuclear Quadrupole Resonance (NQR) System", 63rd ENC Conference, April 24 - 29, 2022, Orlando, FL. ~poster
- T. Kaisar, **P.Dehghanzadeh**, P. Feng, and S. Mandal, "Digitally programmable CMOS Feedback ASIC for Network of Coupled Electromechanical Oscillators", 56th ISCAS Conference, May 21 - 25, 2023, Monterey, CA. ~poster

Grant Proposal Contributions

- National Science Foundation (NSF): Proposal on Multi-Bit Memory-Based Physical Unclonable Function
- National Science Foundation (NSF): Proposal on Look-up Table (LUT) based Programmable and Efficient Compute-In-Memory (CIM) for Neural Processing within SRAM Arrays
- National Institutes of Health (NIH): Proposal on Real-Time Scoliosis Monitoring Using Wearable Sensors
- National Science Foundation (NSF): Chips4Youth- A Culturally Relevant Approach to Microelectronics for Latino Middle Schoolers through Concreteness Fading

Credentials, Certificares and Achievements

- Electromagnetic Simulations Using the EMX Solver, 2024
- Cadence Virtuoso Layout Design, vIC6.1.8/ICADVM20.1, 2024
- Cadence Virtuoso Schematic Editor, vIC6.1.8/ICADVM20.1, 2024
- Nominated for ECE Excellence Award at the University of Florida, 2024
- Nominated for Alec Courtelis Award at the University of Florida, 2023
- Achieved **34th** Rank out of 1100 Participants in the IAUN Entrance Exam for B.S Degree, 2001

Reference

- Prof. Swarup Bhunia, Department of Electrical and Computer Engineering, University of Florida, Gainesville, USA, Email: swarup@ece.ufl.edu
- Dr. Baibhab Chatterjee, Department of Electrical and Computer Engineering, University of Florida, Gainesville, USA, Email: chatterjee.b@ufl.edu
- Dr. Soumyajit Mandal, Brookhaven National Laboratory, NY, USA, Email: smandal@bnl.gov

Peyman Dehghanzadeh, Ph.D.

Warren B. Nelms Institute for the Connected World

Postdoctoral Researcher at the University of Florida

Department of Electrical & Computer Engineering (ECE)
1889 Museum Road, Gainesville, FL 32611

List of References:

- Prof. Swarup Bhunia, Department of Electrical and Computer Engineering, University of Florida, Gainesville, USA
  Email: swarup@ece.ufl.edu,
  Phone:216-246-3426

- Prof. Sandip Ray, Department of Electrical and Computer Engineering, University of Florida, Gainesville, USA,
  Email: sandip@ece.ufl.edu,
  Phone: 352-392-1605

- Dr. Baibhab Chatterjee, Department of Electrical and Computer Engineering, University of Florida, Gainesville, USA
  Email: chatterjee.b@ufl.edu
  Phone: 646-829-6191

- Dr. Soumyajit Mandal, Brookhaven National Laboratory, NY, USA
  Email: smandal@bnl.gov
  Phone: 617-852-5060

Statement of Research Philosophy

Peyman Dehghanzadeh

Introduction:

As a researcher in Electrical and Computer Engineering, I am deeply committed to pushing the boundaries of knowledge in Digital, Analog, and RF IC design. My primary focus is on Hardware Security, Computational-in-Memory (CiM) systems, and RF front-end design, where I strive to develop innovative solutions that bridge theoretical research and real-world applications. My research philosophy is grounded in the belief that cutting-edge technologies, when combined with interdisciplinary collaboration, can address the most pressing challenges in modern electronics. I am passionate about ensuring that my work not only advances academic understanding but also contributes practical solutions that benefit industry and society. My experiences at the University of Florida, under the mentorship of distinguished experts like Professor Swarup Bhunia, Dr. Soumyajit Mandal, and Dr. Baibhab Chatterjee, have profoundly shaped this philosophy. Together, we have worked on groundbreaking projects across both digital and analog domains. As I continue my research journey, I am eager to explore new horizons, advance these fields, and drive innovation that aligns with the mission and vision of the University of Alabama (UAH).

Research Background and Experience:

My research career began during my Ph.D. studies at the University of Florida. My work has spanned several key areas in Electrical and Computer Engineering, with a strong focus on Hardware Security, Computational-in-Memory (CiM) systems, and RF front-end design. One of the cornerstone projects of my research was the development of LUNA-CiM, a programmable compute-in-memory fabric designed to accelerate neural networks. This technology not only significantly reduced power consumption and computational delay but also minimized die area, demonstrating the potential of CiM systems in enhancing computational efficiency. My contributions to this project led to a U.S. patent and an under-review publication in IEEE Transactions on Computers, reflecting the innovative nature of the work. In the realm of Hardware Security, I developed two novel security primitives, MM-PUF and MBM-PUF. These security primitives addressed the challenges of die area overhead by employing resource-sharing techniques, offering a more efficient solution for secure hardware design. The proposed idea in MBM-PUF was patented in 2024. My research experience also extends to RF design, where I tackled the issue of self-interference in MIMO communication systems, work that was published in the *IEEE Transactions on Microwave Theory and Techniques*. In parallel, I developed a system-level design that integrates distributed batteries in 3D ICs, contributing to enhanced efficiency and improved thermal management in these systems. These projects, which led to both a publication and a U.S. patent in 2023, are prime examples of my ability to bridge different fields within Electrical and Computer Engineering. These experiences underscore my commitment to interdisciplinary research and my ability to contribute to a diverse range of projects that align with the University of Alabama (UAH)'s mission of fostering innovation through collaboration.

Throughout my research career, I have contributed to **ten peer-reviewed papers**—seven published and three under review—and secured **five patents**, including three U.S. patents and two invention disclosures, all submitted through the University of Florida. These achievements are a testament to my dedication to advancing the field and my ability to translate research into tangible innovations.

Current Research:

Currently, I am a **Postdoctoral Researcher** at the University of Florida, where I have expanded my research into several new and exciting domains. My current work includes exploring the Internet of Things (IoT), where I am involved in projects focused on wearable devices designed to enhance user posture by providing real-time feedback. This research aims to leverage IoT technologies to improve daily health and wellness through innovative, practical solutions. In addition, I am working on a Nuclear Quadrupole Resonance (NQR) project dedicated to food authentication and the detection of illegal materials. This project seeks to develop advanced techniques for verifying the authenticity and safety of food products and identifying potentially harmful substances, showcasing the broad applicability of my research skills. I have also extended my work on LUNA-CiM to include Single Instruction, Multiple Data (SIMD) applications. This development aims to further enhance the computational efficiency and performance of CiM systems, demonstrating the versatility and potential impact of my research. Furthermore, I am actively

involved in revising several chapters for the book "Hardware Security: A Hands-On Learning Approach." This work contributes to the educational resources available in the field of hardware security and reflects my commitment to both advancing research and supporting the academic community through teaching and resource development.

Future Research Directions:

Looking ahead, my research will focus on several key areas with the potential for significant impact. I plan to advance Computational-in-Memory (CiM) systems further, particularly by extending the LUNA-CiM framework to support SIMD applications. This enhancement aims to improve computational efficiency and flexibility, contributing to energy-efficient and high-performance computing solutions for applications in artificial intelligence and large-scale data processing. In the realm of Internet of Things (IoT), I intend to expand my research on wearable devices designed to improve user posture through real-time feedback. This work will evolve to encompass a broader range of IoT applications, such as smart health monitoring systems and adaptive user interfaces, which could greatly enhance user experience and health outcomes. My focus on hardware security will continue with the development of new security primitives and methodologies. Building on my work with MM-PUF and MBM-PUF, I plan to address evolving threats and enhance the robustness and efficiency of security mechanisms in digital and analog systems. In RF front-end design, I will explore innovations to address challenges like self-interference among antennas in MIMO communication systems, aiming to improve performance and reliability in next-generation communication systems. Additionally, I am committed to contributing to engineering education by developing new curricula and hands-on learning opportunities. This includes contributing to textbooks, designing innovative teaching (research) methods, and integrating real-world applications into educational experiences.
Overall, these future research directions reflect my dedication to pushing the boundaries of Electrical and Computer Engineering and achieving meaningful advancements in both theoretical and practical domains. I look forward to collaborating with colleagues at the University of Alabama (UAH) to drive progress and make impactful contributions to the field.

Research Methodology:

My research methodology integrates a blend of theoretical analysis and practical experimentation to address complex challenges in different domains. I start with rigorous theoretical modeling, developing mathematical models to predict system behavior and performance. This foundational work is critical in creating accurate representations of circuit and system-level interactions. **Simulation and verification** play a crucial role in my approach. I utilize advanced simulation tools to validate models and predict real-world performance. For instance, in my work on Computational-in-Memory (CiM) systems, I use simulation software like Cadence virtuoso to test and refine the LUNA-CiM fabric, ensuring its efficacy in neural network acceleration. This step is essential for optimizing design parameters and anticipating potential issues before physical implementation. **Building and testing physical** prototypes are integral to my research methodology. Prototyping allows me to validate theoretical models and simulations through practical experimentation. This hands-on approach enables the assessment of design concepts and identification of discrepancies between theory and practice, ensuring that the final solution meets performance expectations. **Collaboration with experts** across various fields is a key aspect of my methodology. Engaging with specialists in hardware security, computational systems, and RF design fosters interdisciplinary innovation and provides comprehensive solutions. For instance, I have had the opportunity to collaborate with experts from **Intel**, **AMD**, and **Texas Instruments** which has significantly enhanced the depth and applicability of my research. This collaboration has facilitated the integration of cutting-edge industry insights and advanced techniques into my work. By incorporating diverse perspectives and expertise, my research benefits from a richer, more comprehensive approach, ensuring that the solutions developed are both innovative and practical.

Mentorship and Collaboration:

Throughout my Ph.D. and Postdoctoral Research, I have actively mentored both graduate and undergraduate students across various projects, fostering their development and contributing to their academic and professional growth. For instance, I mentored a new coming Ph.D. student, **Kelsey Horace-Herron,** on the Nuclear Quadrupole

Resonance (NQR) project, which resulted in a publication, demonstrating the successful integration of mentorship with impactful research outcomes. I also guided **Tianjun Wang**, an undergraduate student, in becoming proficient with industrial tools and software such as Advanced Design System (ADS). Tianjun worked on designing and simulating RF circuits and matching networks for front-end RF systems, gaining hands-on experience that bridged theoretical knowledge with practical application. Additionally, I provided mentorship to Ph.D. student **Atri Chatterjee** in circuit design and the use of advanced industrial simulation tools like Cadence Virtuoso. This mentorship involved conducting sophisticated simulations for secure systems, enhancing Atri's skills and contributing to the development of innovative solutions in our research. Beyond these individual mentoring experiences, I have assisted several undergraduate students in the Nelms Institude lab with practical tasks, including soldering, measuring, PCB design, and other essential skills. This support has been instrumental in helping students develop their technical skills and gain hands-on experience in the field.

Collaboration will be a central aspect of my work. I seek to foster **interdisciplinary** partnerships, including potential collaborations with academic and industry leaders. These collaborations will help drive innovation and develop comprehensive solutions to complex engineering challenges. During my research career, I have collaborated with renowned professors at various universities, enriching my research and expanding its impact. For the LUNA-CiM project, we extended our collaboration with Dr. Partha Pratim Pande and Dr. Janardhan Rao Doppa from Washington State University. Additionally, for my work in the RF domain, I closely collaborated with Dr. Arjuna Madanayake and Dr. Satheesh Bojja Venkatakrishnan from Florida International University. These mentoring and collaboration experiences have been integral to my research approach, highlighting the importance of collaboration and the nurturing of emerging talent within the field.

Looking ahead, I am particularly excited about the prospect of contributing to the University of Alabama (UAH)'s dynamic research environment. My expertise and skills align well with the department's focus areas, and I am eager to collaborate with several distinguished faculty members. I believe that my research capabilities and collaborative experience will contribute positively to these areas and foster further advancements within the department.

Conclusion:

In conclusion, my research in Electrical and Computer Engineering is driven by a commitment to pushing the boundaries of Digital IC, Analog IC, and RFIC design. As a Postdoctoral Researcher at the University of Florida, I am expanding my focus into new and impactful areas such as the Internet of Things (IoT), where I work on wearable devices that provide real-time feedback to improve user posture. My efforts in food and material authentication, along with advancing LUNA-CiM technology for SIMD applications, illustrate my dedication to addressing complex challenges through interdisciplinary solutions.

My research methodology is rooted in collaboration with experts from diverse fields. This collaborative approach not only fosters innovation but also ensures that my research integrates a range of perspectives and techniques, enhancing its effectiveness and relevance.

Mentorship has been a cornerstone of my academic journey, where I have guided both graduate and undergraduate students through various projects. This experience underscores my commitment to developing emerging talent and fostering a collaborative research environment.

As I look forward to the opportunity to join the University of Alabama (UAH), I am excited to contribute my research expertise and collaborative spirit to the university's goals. I am confident that my innovative approach, coupled with my dedication to mentoring and interdisciplinary research, will make a significant impact on University of Alabama (UAH) 's research community and academic excellence. I am eager to engage with colleagues at the University of Alabama (UAH) to advance research and drive meaningful discoveries in our field.

Statement of Teaching Philosophy

Peyman Dehghanzadeh

Introduction:

As an educator, my teaching philosophy is grounded in the belief that effective learning stems from a hands-on, research-driven approach that bridges theoretical concepts with practical applications. I am committed to fostering critical thinking, inspiring a passion for innovation, and preparing students to tackle real-world challenges in the fields of Electrical and Computer Engineering. This philosophy has been shaped by my extensive research experience in hardware security, analog IC, RFIC design, and my teaching roles during my PhD under the mentorship of Professor Swarup Bhunia, an IEEE Fellow. These experiences, along with my interactions with graduate and undergraduate students, have profoundly influenced my approach to teaching and continue to drive my dedication to cultivating an engaging and supportive learning environment.

Teaching Methods:

In my teaching, I prioritize methods that actively engage students and connect theoretical knowledge with practical application. I employ a variety of strategies to create an interactive and dynamic learning environment. One of my key methods is **active learning**, where students are encouraged to participate in discussions, problem-solving activities, and hands-on projects. For example, in courses like VLSI Circuits and Technology, I designed assignments that allowed students to work with industry-standard tools like Cadence, applying concepts such as area and power optimization directly to real-world scenarios. I also emphasize **collaborative projects** that foster teamwork and peer learning. By working in groups, students can tackle complex problems, share diverse perspectives, and develop the communication skills essential for their future careers. **Hands-on experiences** are central to my teaching philosophy. In the Hands-On Hardware Security course, I introduced virtual labs that allowed students to explore hardware security concepts in a practical, engaging way, even in an online learning environment. These labs were designed to simulate real-world challenges, providing students with a deep understanding of the subject matter through direct application. Finally, I integrate **technology** into my teaching to enhance learning outcomes. This includes the use of simulation tools, online platforms, and interactive software that allows students to visualize complex concepts and experiment with designs in a controlled environment. These methods collectively aim to not only impart knowledge but also to inspire a passion for innovation and a deep understanding of the subject, preparing students to excel in both academia and industry.

Student Engagement:

Creating an inclusive and supportive learning environment is at the heart of my teaching philosophy. I strive to ensure that every student feels valued and empowered to contribute, regardless of their background or learning style. To encourage **student participation**, I use a variety of techniques that make the classroom a space where all voices can be heard. This includes open-ended discussions, where students are invited to share their ideas and perspectives on the material. I also incorporate activities like think-pair-share, where students first reflect individually, then discuss their thoughts with a peer before sharing with the larger group. This approach not only increases participation but also builds confidence in students who may be less inclined to speak up in a larger setting. **Fostering critical thinking** is another key aspect of my teaching. I design assignments and projects that challenge students to analyze, synthesize, and evaluate information rather than simply memorizing facts. For example, in the VLSI Circuits and Technology course, I encourage students to critically assess different design approaches and make decisions based on trade-offs between power, area, and performance. This process helps them develop problem-solving skills and the ability to think independently. Understanding that students learn in different ways, I cater to **diverse learning styles** by incorporating a mix of visual, auditory, and kinesthetic learning activities. Visual learners benefit from diagrams and simulations, auditory learners from lectures and discussions, and kinesthetic learners from hands-on projects and labs. By offering multiple ways to engage with the material, I ensure that each student can connect with the content in a way that resonates with them. Moreover, I am committed to **inclusive teaching practices** that recognize and address the diverse needs of my students. This includes being mindful of cultural differences, learning disabilities, and varying levels of prior knowledge. I strive to create an

environment where every student feels comfortable asking questions, seeking help, and expressing their unique viewpoints. By fostering a classroom culture that values participation, critical thinking, and inclusivity, I aim to create a learning environment where all students can thrive and reach their full potential.

Assessment and Feedback:

Assessment and feedback are essential to fostering student growth and improving teaching practices. I use a mix of formative and summative assessments, including quizzes, exams, projects, and presentations, to gauge student understanding and progress. For example, design-based projects allow students to apply theoretical knowledge to practical problems, evaluated on creativity, accuracy, and justification of design choices. Also, I ensure assessments align with course objectives, helping students see their relevance and connection to the skills being developed. Incorporating self-assessment and peer review encourages reflection and learning from peers. Timely and constructive feedback is central to my approach. I provide specific, actionable comments that guide students on how to improve. In lab courses, feedback is given on both the final product and the process, emphasizing areas for refinement.

I also prioritize two-way communication, inviting students to discuss their feedback, which deepens their understanding and informs my teaching adjustments. Regularly reviewing assessment outcomes helps me identify areas for clarification and adjust my teaching methods accordingly. Through this approach, I aim to support student learning effectively and continually enhance my teaching practices.

Professional Development:

I am deeply committed to continually improving my teaching skills and staying current with educational practices. I regularly participate in workshops, seminars, and conferences focused on innovative teaching methods and technology integration in education. This commitment ensures that my teaching remains effective and relevant. I actively seek out student feedback and peer reviews, using their insights to refine my approach. For instance, after receiving feedback on my VLSI Circuits course, I introduced more interactive elements, which significantly enhanced student engagement and learning outcomes. By staying open to new ideas and adapting my teaching strategies, I aim to provide a learning experience that is both dynamic and effective, ensuring that I meet the evolving needs of my students.

Inspiring the Next Generation of Engineers:

Teaching specially to **undergraduate** students is an essential part of shaping the next generation of engineers, and I am passionate about fostering a strong foundation in core concepts. I strive to create an engaging and inclusive learning environment where students can grasp complex topics through hands-on experiences, collaborative projects, and real-world applications. I am particularly excited about teaching courses in **Electronics, Analog IC** and **RFIC design**, as these areas provide valuable practical skills and open a world of opportunities in advanced electronics.

Conclusion:

I am fully committed to teaching excellence and to fostering an educational environment that inspires and empowers students. Through my teaching, I aim to contribute meaningfully to the department's mission of advancing knowledge and preparing students for successful careers. My teaching philosophy, which emphasizes hands-on learning, critical thinking, and inclusivity, aligns closely with the values of University of Alabama (UAH). I look forward to bringing this dedication to your institution, helping students thrive, and contributing to the broader academic community.