

Iqtiair M Siddique

Contact: (313) 264-8505 Email: iqtiair.siddique@gmail.com

EDUCATION

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| Ph.D. in Mechanical Engineering | Summer 2025 |
| Master of Science in Systems Engineering | Fall 2023 |
| The University of Texas at El Paso | |
| Master of Engineering in Computer Engineering | Fall 2012 |
| RMIT University | |
| Advanced Diploma in Information Technology | Fall 2013 |
| TAFE (Training and Further Education) | |
| Bachelor of Science in Computer Science | Fall 2003 |
| North South University | |

PROFESSIONAL CERTIFICATION

- Certified Systems Engineering Professional (CSEP), INCOSE
- SysML Model User, Object Management Group (OMG)
- Certified Professional in Requirements Engineering (CPRE), IREB
- Lean Six Sigma Green Belt, TMAC
- Unified Architecture Framework (UAF) Certification, Dassault Systems
- Siemens NX Design Associate, Siemens
- Siemens Additive Manufacturing Designer Associate, Siemens
- ITIL Foundation in IT Service Management, BCS
- Cisco Certified Network Associate (CCNA), Cisco
- Effective Teaching Practice Framework, ACUE and ACE
- Teaching with AI Learning Community (TALC), UTEP InSPIRE
- Responsible Conduct of Research in Engineering, CITI Program

PROFESSIONAL EXPERIENCES

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| Doctoral Research Associate | January 2024 – Present |
| <i>The University of Texas at El Paso</i> | |
| Conduct research as a Ph.D. Research Associate in collaboration with NASA and the Department of Defence (DoD) on aerospace projects. | |
| Graduate Teaching Assistant | June 2023 – December 2023 |
| <i>The University of Texas at El Paso</i> | |
| Facilitated learning as a Graduate Teaching Assistant for Systems Engineering courses. | |
| Skilled Support Coordinator | March 2021 – Jan 2023 |
| <i>General Motors, USA</i> | |
| Worked in an engineering, mock-up, pre-production, manufacturing, prototyping, and supply chain management environment. | |
| Supervisor, Operations Management | April 2015 – Dec 2020 |
| <i>State Transit Authority, Australia</i> | |
| Supervised and coordinated In-service public transport operations and management. | |

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IT Consultant

January 2012 – March 2015

Column Technologies, Australia

Managed and operated IT Service, BMC Remedy ARS, SRM, ITSM customization, and BMC Footprints service desk system.

TECHNICAL SKILLS

Model-Based Systems Engineering (MBSE):

Cameo Systems Modeler, SysML, Requirements Analysis, Capella.

Engineering and Simulation Tools:

STK (Systems Tool Kit), MATLAB, Star-CCM+, Autodesk Maya.

Business Analytics and IT Systems:

BMC Remedy, ITSM Suite, Footprints, AWS, Teamcenter

Programming and Infrastructure (Foundational Knowledge):

C, C++, Java, Networking, Windows Server, Cloud Technology.

SELECTED PEER-REVIEWED JOURNAL ARTICLES

- [1] Siddique, I. M. (2025). *MBSE implementation in small satellite systems: Rationale for adoption over traditional document-based systems engineering*. *International Journal of Geoinformatics Science and Technology*, 1(2), 1–13.
- [2] Siddique, I. M. (2025). *Artificial intelligence and machine learning for requirements prioritization in complex adaptive systems: A systematic review and strategic research directions*. *International Journal of Artificial Intelligence in Mechanical Engineering*, 1(1), 39–46.
- [3] Siddique, I. M. (2024). *Requirements engineering at a turning point: Key research trends shaping the future of systems and software integration*. *Journal of Geotechnical Studies*, 37–49.
- [4] Siddique, I. M. (2024). *Strategic pathways for enterprise success for organizational excellence: A UAF approach*. *International Journal of Progressive Research in Engineering Management and Science*, 4(8), 73–83.
- [5] Siddique, I. M. (2024). *Transforming enterprises through UAF strategic planning: Frameworks and best practices*. *International Journal of Progressive Research in Engineering Management and Science*, 4(8), 50–60.
- [6] Siddique, I. M., & Siddique, A. A. (2025). *Metadata strategies for complex adaptive systems: A systematic review and research perspective*. *International Journal of Geoinformatics Science and Technology*, 1(2), 1–8.
- [7] Siddique, I. M. (2024). *Small satellites: Revolutionizing space exploration and earth observation*. *European Journal of Advances in Engineering and Technology*, 11(3), 118–124.
- [8] Siddique, I. M. (2024). *Emerging trends in small satellite technology: Challenges and opportunities*. *European Journal of Advances in Engineering and Technology*, 11(2), 42–48.
- [9] Siddique, I. M. (2023). *Emerging trends in requirements engineering: A focus on automation and integration*. *European Journal of Advances in Engineering and Technology*, 10(9), 61–65.
- [10] Siddique, I. M. (2022). *Harnessing artificial intelligence for systems engineering: Promises and pitfalls*. *European Journal of Advances in Engineering and Technology*, 9(9), 67–72.

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Citation Metrics (as of August 2025)

Total Citations: 700+ | h-index: 18 | i10-index: 32

<https://scholar.google.com/citations?hl=en&user=e2t4VhwAAAAJ>

EDITORIAL AND REVIEW ACTIVITIES

- Editorial Board Member, *International Journal of Environmental Management and Renewable Energy Systems*
- Peer Reviewer, *Springer Link Automotive Innovation*, *Web of Science*, and other selected journals in systems and applied engineering.

CONFERENCES

- Complex Adaptive Systems Conference (CAS 2025), MIT Campus.
- Southwest Emerging Technology Symposium (SETS 2024), El Paso, TX.
- UTEP InSPIRE Conferences (2023, 2024): Collaborative discussions on student success and innovation.
- Joint NMSU/UTEP Workshop on Mathematics, Computer Science, and Computational Science (2024), Las Cruces, NM.

VISION FOR ADVANCING SYSTEMS ENGINEERING EXCELLENCE

I am committed to advancing Systems Engineering through applied research, structured instruction, and academic collaboration. With experience in Model-Based Systems Engineering (MBSE), requirements engineering, and digital integration, I focus on developing practical, scenario-driven learning rooted in current engineering needs. I work collaboratively with faculty, students, and industry partners to support curriculum development, apply systems thinking across disciplines, and engage in real-world problem-solving. My teaching emphasizes relevance, clarity, and inclusive access to prepare students for professional and research-oriented roles in systems engineering.

STATEMENT OF RESEARCH INTERESTS

My research focuses on Model-Based Systems Engineering (MBSE), requirements engineering, digital engineering, complex adaptive systems (CAS), and aerospace applications, including small satellite development. I am particularly interested in integrating MBSE and digital workflows to improve lifecycle traceability, system adaptability, and overall engineering outcomes. Additional areas of interest include product lifecycle planning, technology management, and the use of artificial intelligence and machine learning in system design.

With over 700 citations, an h-index of 16, and an i10-index of 30, my research has demonstrated both reach and depth. My publications reflect interdisciplinary collaboration and ongoing engagement with emerging trends. I aim to continue contributing to peer-reviewed research and to secure funding that supports innovation in systems engineering practice.

I approach research with a focus on applicability, knowledge transfer, and student involvement. I support graduate students and early-career researchers in developing independent research skills and encourage participation in research that connects theory to implementation. My long-term goal is to contribute to the field through rigorous analysis, responsible mentorship, and inclusive academic development.

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STATEMENT OF TEACHING PHILOSOPHY - Empowering Learners in Systems Engineering

I view teaching as a structured, student-centered process that connects academic standards with practical application. In Systems Engineering, where complexity and interdependency define system behavior, instruction should emphasize methods that support critical thinking, clarity in communication, and accurate problem analysis.

My approach is based on project-based learning and case-driven methods. I incorporate MBSE, requirements engineering, digital engineering, and aerospace-focused projects to help students apply concepts across domains. I emphasize the shift from isolated technical actions to system-level understanding, preparing students to participate in interdisciplinary teams and work on integrated solutions.

Guided by Bloom's Taxonomy and mastery learning, I design assessments that promote progression and sustained skill development. I use structured feedback to guide students through iterative improvement. Based on my experience as a teaching assistant and research mentor, I adapt instructional materials to meet diverse learning needs and academic objectives.

My teaching objectives include delivering current technical content, aligning course activities with real-world engineering practices, and supporting academic and professional pathways, especially for students from underrepresented backgrounds. I aim to provide a respectful and structured learning environment where students are encouraged to build confidence through achievement and engagement.

COMMUNITY ENGAGEMENT

I have participated in the work of the Philosophic Systems Institute, a non-profit organization that applies systems thinking and structured inquiry to address societal issues. My contributions include supporting interdisciplinary outreach programs such as a humanities-based rehabilitation initiative for federal reentry and an educational program designed to promote creativity in early education. These initiatives strengthen reasoning skills, systems awareness, and accessibility to structured learning for underserved populations. I remain committed to community projects that extend educational access and encourage academic participation.

DISSERTATION

Title: *Model-Based Systems Engineering for Aerospace Applications: Strategic Requirements Prioritization in Complex Adaptive Systems and Digital Integration.*

This research focused on the implementation of MBSE to improve the planning and integration of aerospace systems, using a small satellite design as a case study. The study examined how structured requirements prioritization and digital integration enhance system adaptability and lifecycle efficiency. By aligning MBSE with the characteristics of complex adaptive systems, the work contributed to advancing digital engineering methods for aerospace applications.

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GRADUATE THESIS

Title: *Bitcoin's Technical Foundation and Its Potential for a Decentralized and Environmentally Friendly Future.*

This thesis evaluated technical and environmental challenges associated with Bitcoin. Using the coefficient of variation analysis, it examined the system's decentralization and energy demands. The study proposed renewable energy use and improved mining efficiency as strategies to reduce environmental impact while maintaining the potential benefits of decentralized financial models.

KEY PROJECTS

- **MBSE for Small Satellite Development using Cameo**
Led the MBSE team in modeling and verifying a modular small satellite system using SysML in No Magic Cameo, supporting system integration, interface definition, and digital traceability.
- **Digital Verification and Validation of Liquid Methane Engine**
Contributed to the digital verification and validation of a 500 lbf liquid oxygen/liquid methane engine (CROME) using SysML-based MBSE methodology in Cameo as part of Team Six.
- **Design of Water Distribution System (WDS)**
Modeled the WDS architecture through concept development, preliminary design, and detailed design phases using MBSE in No Magic Cameo.
- **MBSE Design of Bluetooth Headphones**
Collaborated in a two-person team to model a Bluetooth headphone system using SysML, covering power, audio, and housing subsystems and defining key interfaces.
- **IVVT Plan for Electronic Toll Collection (ETC) System**
Developed a technical report and system-level IVVT plan as part of a four-member team, ensuring compliance and verification standards for an ETC system.
- **System Design for Auto-Spotter Park Assist Device (ASPAD)**
Developed stakeholder and system requirements specifications (StRS and SyRS) and use cases for ASPAD, covering functional, operational, and business constraints.
- **Systems Engineering for Autonomous Vehicle Architecture**
Produced key system artifacts for a self-driving car project, including use case diagrams, WBS, N2, and RACI matrices, and tool evaluation strategies.
- **BIW Assembly Development at General Motors**
Constructed a reverse-engineered Body-in-White (BIW) assembly for electric and gas vehicles using mock-up methods, focusing on sequencing, revision control, and start-up procedures.