

Joreen Arigye

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Education

Ph.D., Engineering Education Dissertation: Exploring computational modeling and simulation reflections of undergraduate engineering students	Purdue University, 2021-
M.S., Information Technology (software engineering and data science)	Carnegie Mellon University Africa, 2018
B.S., Software Engineering	Makerere University, 2014

Honors and Awards

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| • Best Poster, Collaborative Network for Engineering and Computing Diversity Conference | 2024 |
| • Second Place, Facebook (Meta) & CMU-Africa Cybersecurity Summit | 2018 |
| • CMU-Africa Masters Scholarship, Mandela Institute for Development Studies | 2017 |
| • Makerere University Undergraduate National Merit Scholarship | 2010 |

Journal Publications

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- **Arigye, J.**, Magana, A. J., & Pienaar, E. (in progress). Commitment to team coordination: Reflections from undergraduate engineers following three team projects.
 - **Arigye, J.**, Lyon, J. A., Magana, A. J., & Pienaar, E. (2024). The reflective modeling practitioner: Promoting self-regulation and self-confidence in computational modeling and simulation practices. *The International Journal of Engineering Education*, 40(1), 179–195. ijee.ie/latestissues/vol40-1/19-ijee4423.pdf
 - Magana, A. J., **Arigye, J.**, Udosen, A., Lyon, J. A., Joshi, P., & Pienaar, E. (2024). Scaffolded team-based computational modeling and simulation projects for promoting representational competence and regulatory skills. *International Journal of STEM Education*, 11(1), 34–33. doi.org/10.1186/s40594-024-00494-3

Peer Reviewed Conference Proceedings

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- **Arigye, J.**, Purzer, S., Zoltowski, C. B., Zakharov, W. (in review). WIP: Challenges and Affordances of Engineers in Data Life Cycle Ethical Management
 - Zakharov, W., Purzer, S., Zoltowski, C. B., & **Arigye, J.** (in review). Tools for Data Life Cycle Ethical Management for Undergraduate and Graduate Researchers
 - Purzer, S., Zoltowski, C. B., Zakharov, W., & **Arigye, J.** (2024). Developing the design reasoning in data life-cycle ethical management framework. *ASEE Annual Conference and Exposition*, Portland, Oregon. doi.org/10.18260/1-2-47172
 - **Arigye, J.** (2024). Exploring the landscape of online coding education in Africa: A literature review. *47th MIPRO ICT and Electronics Convention*, Opatija, Croatia, 678–683. doi.org/10.1109/mipro60963.2024.10569900
 - **Arigye, J.**, Udosen, A. N., Joshi, P. P., & Magana, A. J. (2023). The evolution of team coordination commitments in the context of computational projects. *IEEE Frontiers in Education Conference (FIE)*, College Station, Texas, 1–5. doi.org/10.1109/fie58773.2023.10343201

- **Arigye, J.**, Magana, A. J., Lyon, J. A., & Pienaar, E. (2023). Biomedical and Agricultural engineering undergraduate students programming self-beliefs and changes resulting from computational pedagogy. *ASEE Annual Conference and Exposition*, Baltimore, Maryland. doi.org/10.18260/1-2-42275
- Brijmohan, Y., Olayemi, M., Dansu, V., Babalola, I., Gamielien, Y., Ezika, I., **Arigye, J.**, Asogwa, U., & Vaye, C. (2022). African diaspora engineering education student experiences in the US: A collaborative autoethnographic study. *IEEE IFEEES World Engineering Education Forum-Global Engineering Deans Council*, 1-7, Cape Town, South Africa. doi/10.1109/weef-gedc54384.2022.9996261

Book Chapter and Magazine Feature

- Purzer, S. & **Arigye, J.** (in press). Engineering design reasoning for conscientious decision-making. In L. English & T.H. Lehmann (Eds.), *Ways of thinking in STEM-based problem solving: Learning in a new era*. Routledge.
- Kirabo, L. (2019). The one about resilience, energy, culture, and crafting. In XRDS : Crossroads, The ACM Magazine for Students, 26(2), 60-63. doi/10.1145/3368079

Posters and Presentations

- Zakharov, W., Purzer, S., Zoltowski, C.B., **Arigye, J.**, Maza Nava, J.J.R., Sewell, S.M. (In review). *IUSE: Prioritizing data life cycle ethical management education for engineering undergraduate researchers*
- Zakharov, W., Purzer, S., Zoltowski, C.B., **Arigye, J.**, Maza Nava, J.J.R., Sewell, S.M. (2024, Jun 16-18). *Prioritizing data life cycle ethical management for shaping next generation researchers* [Poster Presentation]. Improving Undergraduate Education (IUSE) National Summit, Washington, D.C., US.
- **Arigye, J.** (2024, Feb 25-28). *Learning to code online: Exploring the African landscape* [Poster Presentation]. 2024 Collaborative Network for Engineering & Computing Diversity (CoNECD) Conference. Arlington, VA, US.
- **Arigye, J.** (2024, Feb 13). *Coordination commitments during computational modeling* [PechaKucha Presentation]. 3rd Annual Graduate Women in Engineering Network (WiE) Symposium, Purdue University, West Lafayette, IN, US.
- Olayemi, M., Adeniranye, D., Dansu, V., **Arigye, J.**, Benjamin, M., Babalola, I. (2024, Mar 10-14) *From virtual premises to real promises: Tracking the formation of the African engineering education fellows in diaspora* [Abstract Presentation]. 68th Comparative and International Education Society Annual Meeting, Miami, FL, US.
- Udosen, A., **Arigye, J.**, Magana, A. J., Pienaar, E. (2024, Mar 20-24). *Predicting quantized students team-based reflection data using supervised machine learning approaches* [Poster Presentation]. 50th National Society of Black Engineers Convention (NSBE) Technical Research Exhibition, Atlanta, GA, US. doi.org/10.13140
- Ahn, S., Shindhe, N., **Arigye, J.**, Koh, D., Maselli, A. (2023, Nov 8). *A cost benefit analysis of the co-surgeon model in DIEP flaps and other microsurgical procedures* [Poster Presentation]. Warren Alpert Medical School Academic Annual Symposium, Brown University, Providence, RI, US. repository.library.brown.edu
- **Arigye, J.**, Magana, A. J., Lyon, A.J., Pienaar, E. (2023, Mar 22-26). *Biomedical and Agricultural Engineering Undergraduate students Programming self-beliefs and changes resulting from computational scaffolding* [Poster Presentation]. 49th National Society of Black Engineers Convention (NSBE) Technical Research Exhibition, Kansas City, MO, US.
- **Arigye, J.** (2019, May). *Leveraging data to develop sustainable energy and financial inclusion in Africa* [Workshop Presentation]. SDM Workshop for Data Mining in/for Africa by IBM Research Africa, Nairobi, Kenya.

Teaching Experience

- ENE 506: Content, Assessment, and Pedagogy (Jan - May 2024) Faculty Apprentice
- ME 597: IoT for Smart Manufacturing, Intro to Google Colab (Feb 2023) Guest Instructor
- Python for the Future, Gifted Education Research Institute (Jul 2023) Python Instructor
- Server-side Development, Clarke International University (Nov 2019 - Jul 2021) NodeJS Instructor
- Intro to Git and GitHub, LaunchLab at Stellenbosch University (Jul 2021) Workshop Facilitator
- Intro to Data Science on Youtube, Upskill, Innovation Village (Mar 2020) Workshop Facilitator
- 18-641: Design Patterns for Smartphone Devt, CMU-Africa (Fall 2018) Graduate Teaching Assistant

Research Experience

- **Graduate Research Assistant**, ELO, Purdue University Jan 2024 - Present

In the Engineering Learning Observatory (ELO) lab, as part of the NSF IUSE project “Prioritizing Data Life Cycle Management for Shaping Next Generation Researchers”, I led the end-to-end publication process for two ASEE conference papers. This involved conducting literature reviews, developing the manuscript, coordinating feedback from co-authors, incorporating reviewer comments, managing revisions, preparing final submissions, and conference presentations. In collaboration with the team, I contributed to the project research design, including assessing survey instruments, planning participant recruitment, and conducting data collection and analysis. Additionally, I co-authored a book chapter through an iterative writing and revision process. I also supervised two undergraduate students, mentoring them through research activities such as data collection, analysis, literature review, and academic writing.

- **Graduate Research Assistant**, ROCKETEd, Purdue University Aug 2021 - Dec 2023

In the Research on Computing in Engineering and Technology Education (ROCKETEd) lab, as part of the Emergent Mechanisms in Biology of Robustness Integration and Organization (EMBRIO) Institute, I led the end-to-end development and presentation of three conference papers, two journal manuscripts, and several poster presentations. I also mentored incoming masters and PhD students, guiding them through research processes, writing, and presentations, all while contributing to the lab’s overall research objectives.

- **Independent Study**, UMEME & CMU-Africa Aug 2018 - Dec 2018

In collaboration with Uganda’s leading electricity distribution company, UMEME, I conducted a case study research project to assess the company’s readiness to become data-driven. This involved analyzing internal systems, databases, and their interactions. I identified a diverse range of ad-hoc interactions between isolated systems and mapped the data flow structure in a detailed report. My responsibilities included managing and coordinating interview sessions with UMEME stakeholders, visualizing the existing systems, developing the final report, and presenting my recommendations to the team.

Industry Experience

- **Software Engineer**, Software & Application Innovation Lab, Boston University May - Jul 2023

Developed a Docker pipeline for the deployment of SPICE-based simulator PACT and Visual PACT and developed a Python pipeline to enhance the accessibility of large SAS data for School of Medicine.

- **Data Analyst**, Fenix International (Now Engie Energy Access) Feb 2019 - Jul 2021

Managed the analytics database scripting needs for business reporting. Conducted team training to boost data analysis capacity, gathered A/B testing requirements, and designed experiments. Oversaw the maintenance of machine learning models, ensuring data-driven business interventions.

- **Data Fellow**, Fenix International (Now Engie Energy Access) May 2018 - Jul 2018
Performed experimentation and analytics for solar loan repayment interventions.
- **Administrative Assistant**, Carnegie Mellon University Africa Sep 2017 - Jun 2018
Conducted surveys and polls to understand student needs, assisted the student services officer in coordinating events such as cultural nights, sports days, and lecture series, and developed targeted marketing materials to promote these activities.
- **Business Process Analyst**, UMEME Apr 2021 - Aug 2021
Coordinated the successful implementation of a company-wide off-the-shelf HR system for a workforce of over 1000 employees. Provided support in identifying, designing, and executing business process re-engineering initiatives to enhance overall efficiency.
- **System's Developer**, InfoTronics Business Systems Oct 2016 - Jun 2017
Developed three information systems for data capture and business reporting, involving requirements elicitation and comprehensive testing. Executed data input, cleaning, and analysis based on client specifications. Additionally, provided client training on system usage.
- **Supply Chain Management Apprentice**, Medical Access Uganda Limited Dec 2014 - Sep 2016
Coordinated implementation and testing of the company's information system with contractors, analyzed data for monitoring and evaluation, managed business process review for ISO certification, supported procurement and distribution of ARVs to health centers in Uganda, and ran a help desk providing IT support including installation, maintenance, and troubleshooting.
- **Software Engineering Intern**, Uganda Revenue Authority May 2013 - Aug 2013
Developed a windows web service as part of the company's integration process.

Invited Talks

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- "Research or Professional path", Women in Tech, CMU Africa Nov 2021
 - "Getting the workforce ready for data science opportunities", DataFest Africa Apr 2021
 - "Data science in industry", Pyladies Kampala, Outbox Nov 2020
 - "Leveraging ML in energy", Women in Machine Learning & Data Science Jan 2020
 - Panelist, Resources, skills, challenges in data analytics, African Women in Tech Feb 2020
 - Panelist and Judge, Educating The Children Sept 2019 - Dec 2020
 - "How to be deliberate about gaining technical skills", Coding Girls, Cavendish University Aug 2019
 - "Data Science for health", Data science in Africa workshop, Pulse Lab Kampala Aug 2016

Leadership and Professional Membership

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- Graduate Student Representative, Engineering Education Student Association 2023-2024
 - Vice President Membership, Techy Talkers Toastmasters, CMU Africa 2017-2018
 - Data Science Club, CMU Africa 2017-2018
 - Communication Chair, NSBE Graduate Committee 2023
 - Technical Advisor and Cofounder, AnJ Data Management Solutions Ltd 2021-2022
 - Advisory board member, Code Queen under Educating the Children, Uganda 2019

- Member, Black Graduate Student Association 2022
- Member, Society of Women Engineers 2022
- Member, Maryhill high school old girls, Girl Child Education Fund 2023
- Member, Engineering Education Research in Africa 2022
- Education Advisory, Island of Hope (Non-profit for climate advocacy) 2023

Travel Grants

- GradTrack Mentor Award, Purdue Graduate Engineering Oct 2024
- Grant to do recruitment at NSBE, Purdue Graduate Engineering Mar 2024
- Grant to do poster presentation at CoNECD conference Feb 2024
- Grant to do conference presentation Graduate Women in Engineering Feb 2024

Professional Service

- Journal Reviewer, Education and Information Technologies
- Mentor for Undergraduate and Graduate students

Community Service

- Change maker in Spotlight, Mandela Institute for Devt Studies (MINDS) Africa newsletter 2023
- Social Media Feature, Fenix(Engie), Women's day campaign on inspiring women into Tech 2020
- Volunteer, Conservation Effort for Community Devt, Youth Advocacy & Environment 2009 - 2010
- Volunteer, Kakukuru Primary School, Community Service teaching Maths & Science 2009 - 2010

Certifications and Trainings

- What Works Hub for Global Education Annual Conference: University of Oxford, UK Sept 2024
- AI Workshop, Purdue Digital Agriculture: Purdue University, US Aug 2024
- Transforming Engineering Education Symposium: MIT, Alborg, Harvard University, US Jun 2023
- Level 3 Award in Education and Training: Equip Training, UK Feb 2021
- Leadership Training Certificate: Mandela Institute for Devt Studies, South Africa 2017 & 2020
- Africa Science Week: Next Einstein Forum, Kigali, Rwanda Oct 2018
- HackAfricaAI: CMU-Africa, Kigali, Rwanda Nov 2018
- Transform Africa Summit: Kigali, Rwanda May 2018
- The 3rd Africa Summit Grid Forum: Kigali, Rwanda Oct 2018
- Emerging Leaders Seminar: African Leadership University, Kigali Rwanda Jul 2018
- Summer School on Machine Learning and Data Science: Makerere University, Uganda Jul 2016
- Data Science in Africa Workshop: Pulse Lab, Kampala, Uganda Jul 2016