Roland Oruche

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Education

Ph.D. Computer Science | University of Missouri – Columbia | Aug 2019 – May 2023 (Projected)

- *Thesis Advisor*: Prof. Prasad Calyam
- *Cumulative GPA*: 3.73/4.00
- *Coursework*: Artificial Intelligence, Machine Learning/Pattern Recognition, Computer Vision, Advanced Cloud Computing, Neural Networks, Cyber Defense

B.S. Information Technology | University of Missouri – Columbia | Aug 2015 – May 2019

- *Minors*: Mathematics, Computer Science
- *Dean's List*: May 2015 – Aug 2019
- *Coursework*: Design & Analysis of Algorithms, Software Engineering, Theory of Computation, Cloud Computing, Operating Systems, Computer Networks

Awards & Fellowships

- **Multicultural Engineering Program Graduate Fellowship | Aug 2019 – Present |** Awarded $13,000
  Fellowship recipient of program that supports scholars who show promise in their distinguished research fields
- **Dean's Excellence Fellowship | Aug 2019 – July 2020 |** Awarded $30,000
  Awarded the Dean's Scholar Fellowship as a first year Ph.D. student at the University of Missouri
- **MU Diversity Scholarship Award | Aug 2015 – May 2019 |** Awarded $15,000 (per year)
  Awarded merit-based scholarship among students from underrepresented racial and ethnic backgrounds

Relevant Experience

Graduate Research Assistant | Cyber Intelligence Center | Advisor: Prof. Prasad Calyam | Aug 2019 – Present

- Conducted research to develop novel automated knowledge discovery solutions for science gateways
- Investigated solutions augment the COVID-19 literature review process via evidence-based filtering recommender system (RS) knowledge recommenders through a website - **www.KnowCOVID-19.org**
- Led usability study to reduce clinicians' manual literature workflow using ML and NLP techniques service that can sort through 10,000+ medical journals for topics, tools and other important criteria
- Research work featured in MU Campus News release (https://engineering.missouri.edu/2020/06/site-connects-users-to-reliable-information-about-covid-19)
- Technologies/Tools: Python 3 • Java • Angular • MySQL • RESTful APIs • Spring Boot • Apache {Maven, Spark}

Graduate Research Mentor | NSF REU in Consumer Networking Technologies | May – July 2019

- Investigated threat modeling and ML-based anomaly detection system designs for cybersecurity attacks in immersive, social virtual reality (VR) systems
- Applied a multi-label KNN algorithm and statistical analysis to classify network/application-based attacks
- Minimized disruption of security and privacy attacks in VR systems and improved user immersive experience
- Technologies/Tools: Python 3 {TensorFlow, NumPy, Pandas} • JavaScript • NSF GENI Cloud • Docker

Undergraduate Research Assistant | VIMAN Lab | Advisor: Prof. Prasad Calyam | Apr 2018 – May 2019

- Managed a team of graduate research assistants to develop an NSF-funded VR application for autism students
- Conducted a research study on 12 subjects comparing existing desktop learning platforms with VR application
- Increased subjects' quality of experience by 14% using performance measures from the VR education platform
- Technologies/Tools: JavaScript • Unity • C/C++ • Google Cloud • Docker • Version Control {Git}

Research Intern | NSF REU in Consumer Networking Technologies | May – July 2018

- Conducted research on characterization of security, privacy, and safety (SPS) threats to understand vulnerabilities in well-defended VR learning systems
- Utilized threat-to-component system mappings to design a risk assessment framework for generating risk scores
- Evaluated insights of associated risks in various system modules to inform proper VR policy management
- Technologies/Tools: JavaScript • HTML/CSS • SQL • NSF GENI Cloud • Agile • Version Control {Git}

Projects

ScholarFinder | Cyber Intelligence Center | Aug 2020 – Present

- A knowledge embedding recommendation that finds suitable scholars across multi-disciplinary research domains

KnowCOVID-19 Web Application | Cyber Intelligence Center | Mar 2020 – Present

- A recommender system that uses AI-based analytics to filter high quality information from COVID-19 publications

OnTimeRecommend Recommender-as-a-Service | Cyber Intelligence Center | Mar 2020 – Oct 2020

- A recommender platform comprised of microservices that augments pre-defined workflows of science gateways

vSocial: Social Virtual Reality Learning Environment | VIMAN Lab | Apr 2018 – May 2020

- An open-sourced VR education platform designed to improve the social skills of youth with learning impediments

Publications & Presentations

- **R. Oruche**, S. Valluripally, V. Akashe, A. Gulhane, P. Calyam, J.P. Stichter, Z. He, "A Next Generation Social Virtual Reality Learning Environment Platform for Special Education" *Submitted to the IEEE Transactions on Human-Machine Systems*. 2021.
- Y. Zhang, **R. Oruche,** S. S. Sivarathri, P. Calyam, "ScholarFinder: Knowledge Embedding based Recommendation using a Deep Embedded Clustering Model", *Submitted to the IEEE Transactions on Knowledge and Data Engineering*. 2020.
- K. B. Vekaria, P. Calyam, **R. Oruche**, Y. Zhang, S. Wang, "'Bring-your-own' Plug-in Management Middleware Framework for Programmable Science Gateways", *Science Gateways Community Institute (SGCI) Gateways Conference*. October 2020.
- S. Valluripally, Ben F., B. Kruse, B. Palipatana, **R. Oruche**, A. Gulhane, K. A. Hoque, P. Calyam, "Detection of Security, Privacy Attacks Disrupting User Immersive Experience in Virtual Reality Learning Environments", *Submitted to the IEEE Transactions on Network and Service Management*, August 2020.
    - Also presented at the MU Summer Research & Creative Achievements Forum. July 2020
- S. S. Nuguri, P. Calyam, **R. Oruche**, A. Gulhane, S. Valluripally, J. P. Stichter, Z. He, "vSocial: A Cloud-based System for Social Virtual Reality Learning Environment Applications in Special Education", *Multimedia Tools and Applications (MTAP) Journal*. 2020.
- A. Gulhane, A. Vyas, R. Mitra, **R. Oruche**, G. Hoefer, S. Valluripally, P. Calyam, K. A. Hoque, "Security Privacy and Safety Risk Assessment for Virtual Reality Learning Environment Applications", *IEEE Consumer Communications & Networking Conference (CCNC)*. 2019.
    - Also presented at the CoMo Reality AR/VR Conference in Columbia, MO. Sept 2018
    - Also presented at the MU Summer Undergraduate Research & Creative Achievements Forum. July 2018

Leadership Activities

- **Volunteer & Teaching Assistant | EnCircle Technologies | Mar. 2020 – Present**
  Assisted youth with Autism Spectrum Disorder (ASD) to develop technical skills and improve for employment opportunities
- **Upsilon Pi Epsilon (ΥΠΕ) | University of Missouri | 2020 – Present**
  Student member of a CS honors society recognized by both the ACM and IEEE Computer Society
  Attributed to creating events for company outreach that presents students with job opportunities/employment
- **National Society of Black Engineers (NSBE) | University of Missouri | 2019 – Present**
  Committee member of a Black engineering society aimed to excel academically and create community impact –
  Assisted in workshops for professional/leadership development regarding job interviews and elevator pitches
- **Graduate and Professional Student Leadership Retreat | University of Missouri | Mar. – Apr. 2020**
  Active leadership program participant that led workshops for graduate, professional students from various fields
  Leadership contributions was featured in a MU Student Affairs on handling difficulties during COVID-19 pandemic; article written by Dr. William Stickman (Vice Chancellor – Student Affairs)
- **Research Mentor | NSF REU in Consumer Networking Technologies | May – July 2019**
  Mentored students to gain research experience by providing helpful guidance on how to perform research
- **Mizzou Computing Association (MCA) | University of Missouri | 2016 – 2019**
  Committee member of MU's largest group for computer, technology, and programming
  Contributed to setting up courses/workshops to improve the technical development of committee members