# MAINUDDIN SHAIK

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## SUMMARY AND ASPIRATION

Dedicated educator and researcher in computer and information sciences with expertise in Cybersecurity, AI/ML, Business Science, Data Science and Social Networking. Proven ability to teach, develop curricula, and mentor students in both undergraduate and graduate programs. Strong background in social computing, research methodologies, and large-scale data analytics with extensive publication record and grant-funded research. Committed to fostering an inclusive and dynamic learning environment while advancing computing education and research.

#### **RESEARCH INTEREST**

- Cybersecurity and Disinformation Detection
- AI, Machine Learning (ML) and Natural Language Processing (NLP)
- Data Science and Informatics
- Multimodal Data Analytics
- Social Network Analysis

#### **EDUCATION**

University of Arkansas at Little Rock, Arkansas PhD in Computer and Information Science.	Dec 2024
- Dissertation: Role of Multimedia and Conative Words in Online Socio-Political Mobilization – Nov 14, 2024)	e (defended
<b>University of Arkansas at Little Rock,</b> Arkansas Master of Science in Information Quality.	May2016
Edinburgh Napier University, Scotland Master of Science in Electrical and Electronic Engineering.	June 2012
Chirala Engineering College JNTU Kakinada, Andhra Pradesh Bachelor of Technology in Electrical and Electronic Engineering.	June 2010

## **PROFESSIONAL EXPERIENCE**

## Sul Ross State University, Texas

May 2025 – Current Assistant Professor of Cybersecurity: Dept of Natural & Behavioral Sciences-Comp Science

# **KEY PROJECTS**

- Serve as Assistant Professor with teaching and research responsibilities in **Cybersecurity** and related areas.
- Lead the development and modernization of the Computer Science curriculum, aligning academic offerings with current industry standards, emerging technologies, and regional workforce needs.
- Contribute to interdisciplinary program expansion by designing and delivering Business Technology and Information Systems courses at the undergraduate and graduate levels, bridging technical expertise with strategic business applications.
- Mentor students in academic and professional development, including guidance on capstone projects and career preparation in cybersecurity and applied computing fields.
- Actively participate in departmental committees, academic planning, and initiatives to enhance student engagement and retention.

**UALR**, Little Rock, Arkansas **Graduate Research Assistant:** 

## **KEY PROJECTS**

- Social Media Engagement & Influence Models
  - Developed ML models to analyze digital engagement and predict influence patterns.

Aug 2019 – Dec 2024

- Large-Scale NLP & LLM Testing
  - Evaluated multiple LLMs and semantic search models for advanced AI applications.
- **Misinformation Detection in Elections** 
  - Created AI-driven models to detect misinformation patterns in Taiwan's 2024 elections.
- Taught and assisted in multiple undergraduate and graduate courses, including:
  - Social Computing (IFSC 4360/5360) (Spring 2021, 2022, Fall 2022)
  - Guest lectures on data analytics, and network analysis.

Models Used: NLP models (BERT, LDA for topic modeling), and toxicity analysis frameworks (Perspective API).

**Results:** Uncovered hidden patterns in disinformation networks, supporting counterdisinformation strategies.

- Developed **course materials, hands-on lab exercises, and assessments** for database management, data analytics, and cybersecurity modules.
- Achieved **95% positive feedback** in teaching evaluations.
- **Mentored and advised** graduate and undergraduate students on research projects involving **databases**, cybersecurity, and social network analysis.
- Analyzed large-scale social media data (e.g., Twitter, TikTok, Instagram, Reddit), applying advanced text mining and network analysis techniques.
- **Multi-platform information campaigns:** Led multiple research projects focused on multi-platform information campaigns funded by multiple departments of defense (DOD) agencies from these countries (USA, Europe and Australia). Analyzing global geo-political conflicts, socio-economic crises, and situational awareness exercises in these countries (USA, Brazil, Peru, EU, Indo-pacific, Ukraine-Russia, and Australia).

**Impact:** Improved stakeholder decision-making and policy formulation for key regions, including Indo-Pacific, Ukraine-Russia, and EU countries.

**Methodologies Used**: Sentiment Analysis, Topic Modeling, Named Entity Recognition (NER), Network Analysis, and Clustering.

Tools & Frameworks: Gephi, ORA, Tableau, and MySQL.

**Results**: Achieved 85% accuracy in identifying coordinated inauthentic behavior (CIB) and 90% accuracy in misinformation categorization.

• **Cross-Media Network Models**: Designed and implemented information diffusion models using **graph theory** and **community detection algorithms** (e.g., Louvain and Girvan-Newman).

**Methodologies Used:** Graph Theory, Community Detection (Louvain, Girvan-Newman), Sentiment Analysis, Keyword Co-occurrence Analysis, Multi-Platform Data Integration, Validation Techniques.

Tools & Frameworks: Gephi, Tableau, MySQL.

**Outcome**: Enhanced understanding of how narratives spread across digital platforms, influencing intervention strategies. Improved narrative mapping accuracy by 20%, influencing intervention strategies and stakeholder decisions.

• Published 14+ conference papers and submitted 5 journal articles; delivered invited talks at prominent workshops.

Recognition: Boosted the research team's visibility and secured multiple research grants.

• Mentored students in research methodologies, data analysis, and tool development.

Effect: Improved junior researchers' skills and expanded the team's research output.

Jan 2015 – May 2016

- Provided BA support for software enhancement projects for five major airlines (United Airlines, COPA America, Island Air, Virgin Atlantic, Flybe) at HPE/DXC Technologies.
- Built and optimized **SQL-driven BI reporting solutions**, enabling data-driven decisionmaking for major airline clients.
- Automated ETL workflows, improving data extraction efficiency by 40%.
- Led **data modeling initiatives**, defining **data warehouse architectures** and improving **SQL query performance** for faster insights delivery.
- Designed workflows and conducted gap analyses, applied skills directly applicable to project management.
- Developed Business Rules Document and Requirement Traceability Matrix (RTM) to ensure comprehensive tracking of project requirements.
- Conducted user and business requirements gathering through discussions, brainstorming sessions, and observation of compliance department workflows.
- Collaborated with SMEs to define business requirements and analyze potential technical solutions.
- Led regular meetings with business user groups, system architects, developers, database teams, and quality testers to resolve issues and ensure project success.
- Prepared workflow scenarios and conducted gap analysis to identify discrepancies and improve processes.
- Utilized MS Office (Word, Excel, Access, PowerPoint) for analysis, presentation, and documentation throughout the project.

## UALR, Little Rock, Arkansas Graduate Research Assistant

- Prepared workflow scenarios and conducted gap analysis to identify discrepancies and improve processes.
- Utilized MS Office (Word, Excel, Access, PowerPoint) for analysis, presentation, and documentation throughout the project.
- Crawled and extracted unstructured data from various blog sources.
- Created tables, stored procedures, and defined functions, as well as SQL scripts for tuning and scheduling.
- Developed SQL code to access and manipulate data stored in relational databases.
- Defined Data Quality Dimensions and developed a Scoring Matrix to assess data accuracy.
- Analyzed and visualized collected data using various visualization tools.

#### SKILLS

**Teaching Tools:** Proficient in academic tools like LaTeX, and learning management systems (e.g., Blackboard, Canvas) to facilitate seamless instruction and course management.

**Curriculum Development:** Experience designing interactive modules and assignments for courses such as Social Computing and Data Analysis.

**Technical Expertise:** Advanced knowledge in Python, MySQL, Tableau, Gephi, and NetworkX for research and teaching applications.

**Research Techniques:** Expertise in topic modeling, named-entity extraction, emotion detection, and multimodal data analysis to enhance understanding of complex datasets.

## AWARDS and ACHIEVEMENTS

- Nominated for the Best Paper Award at HICSS-58 (2025), the world's leading and most prestigious conference in information systems and interdisciplinary system sciences, held in Hawaii.
- Outstanding COSMOS lab Research Award May-2024.
- Won Student Research and Creative Works Award, 2nd Place [April 28, 2023].
- Won Donaghey college of science, technology engineering and mathematics **Dean's** Elevator Speech Award(\$100) at Research Expo [April 28, 2023].
- Best Paper Award, SOTICS 2021 IARIA.
- **DCSTEM student Travel Awards** for prestigious Information System Conferences such as AMCIS-2024 and HICSS-2024.
- Student Travel Awards for SBP-BRiMS 2023, SBP-BRiMS 2024 conferences in Carnegie Mellon University.

## **RESEARCH PROJECTS**

## Dissertation: Role of Multimedia and Conative Words in Online Socio-Political Mobilization

• Developed a novel multi-method framework integrating cognitive science, NLP, and network analysis to analyze how language influences mobilization in information campaigns.

## Information Diffusion Models Using Graph Theory

- Built graph-based models to study how narratives spread across online networks.
- Leveraged **community detection (Louvain, Girvan-Newman)** to identify key influencers and information flow.

## Indo-Pacific Project (Lead, 4 MS Students)

• Collected data from multiple social media platforms to **analyze narratives used in covert influence operations in the Indo-Pacific region**.

## Multidisciplinary University Research Initiative (MURI)

• Collected and analyzed blog data to develop novel models for factional dynamics and conflict prediction.

#### Australian-DOD Project (Lead, 1 MS Student)

- Extracted and analyzed social media data on the Australian COVID crisis.
- Developed an information science approach to enhance situational awareness for policymakers.

#### **Collective Action Project**

- Collected social media data to study online collective movements.
- Developed a framework leveraging social network theories to model mobilization, network formation, and cognition in digital activism.

## **PUBLICATIONS**

## **Journal Articles**

 Shaik, Mainuddin., & Agarwal, N. (2024). A computational analysis of online political discourse on the Ukrainian-Russian blogosphere. *International Journal on Advances in Software*, 17(3-4). ThinkMind-IARIA.

## **Conference Proceeding Papers:**

- 1. Shaik, Mainuddin, & Agarwal, N. (2025). Analyzing TikTok's role in mobilizing dynamics for information campaigns during Taiwan's 2024 elections. In *Proceedings of the 58th Hawaii International Conference on System Sciences (HICSS)*. Nominated for a Best paper.
- 2. Shaik, Mainuddin., Cakmak, M. C., Spann, B., & Agarwal, N. (2024). Characterizing multimedia adoption and its role on mobilization in social movements. In *Proceedings of the* 57th Hawaii International Conference on System Sciences (HICSS).
- 3. Shaik, Mainuddin., Yousefi, N., & Agarwal, N. (2024). Role of co-occurring words on mobilization in Brazilian social movements. In *Proceedings of the 30th Americas Conference on Information Systems (AMCIS)*.
- 4. **Shaik, Mainuddin**., Yousefi, N., Agarwal, N., & Spann, B. (2024). Evaluating role of Instagram's multimedia in connective action leveraging diffusion of innovation and

cognitive mobilization theories: Brazilian and Peruvian social unrest case. In Proceedings of the 2023 10th International Conference on Behavioural and Social Computing (BESC).

- 5. Shaik, Mainuddin., Hussain, M. N., Stine, Z., & Agarwal, N. (2021). Developing situational awareness from blogosphere: An Australian case study. In *Proceedings of the Eleventh International Conference on Social Media Technologies-SOTICS* Best paper award.
- 6. Cakmak, M. C., **Shaik, Mainuddin**., & Agarwal, N. (2024). Emotion assessment of YouTube videos using color theory. In *Proceedings of the 2024 9th International Conference on Multimedia and Image Processing (ICMIP)*.
- 7. Yousefi, N., **Shaik, Mainuddin**., & Agarwal, N. (2024). Characterizing multimedia information environment through multi-modal clustering of YouTube videos. *arXiv preprint arXiv:2402.18702*.
- 8. Khaund, T., **Shaik, Mainuddin**., & Agarwal, N. (2021). Data collection and sensemaking from Telegram: A case study of Ukrainian political leaders' channels and chat groups.
- 9. Khaund, N. A. T., Hussain, M. N., & Shaik, Mainuddin. (2021). Telegram: Data collection, opportunities, and challenges. *Springer International Publishing*.
- 10. U. Onyepunuka and T. Marcoux, Shaik, Mainuddin, Mayor Inna Gurung and Nitin Agarwal. "A Multidimensional Analysis of YouTube Communities in the Indo-Pacific Region," in *The Twelfth International Conference on Social Media Technologies, Communication, and Informatics (SOTICS 2022)*, October 16-20, 2022, Lisbon, Portugal.
- 11. Adeliyi, O., Adesoba, A., **Shaik, Mainuddin**., & Agarwal, N. (2022). A multi-method approach to analyze Australia-China geopolitical discourse on YouTube. *OSF*.

## Books/Book Chapters:

 Akinnubi, A., Agarwal, N., Shaik, Mainuddin., Okeke, V., & Sunmola, A. (2023). Powering blogosphere analytics with BlogTracker: COVID-19 case study. In *Cyber Security and Social Media Applications* (pp. 1–27).

## SERVICES

#### **Teaching Assistant:**

• Course Instructor, Social Computing (Spring 2021, 2022; Fall 2022):

Designed and delivered modules that integrated theoretical foundations with practical applications, focusing on advanced topics such as network analysis, sentiment detection, and information diffusion. Developed interactive projects using tools like Python, Gephi, and Tableau, enabling students to apply their learning to real-world data. Received positive student feedback for engaging teaching methods and emphasis on skill-building for industry readiness.

• Mentorship and Guidance:

Mentored graduate and undergraduate students in research projects, including data collection, preprocessing, and analysis. Two mentees co-authored papers presented at

prestigious conferences such as AMCIS and HICSS. Focused on fostering critical thinking and problem-solving skills to prepare students for academic and professional success.

# • Innovative Teaching Practices:

Incorporated flipped classroom techniques, active learning strategies, and case study analysis to increase student participation and deepen understanding of complex topics. Leveraged Learning Management Systems (LMS) to facilitate seamless communication and resource sharing with students.

## Volunteer for:

• Volunteered as a multiple session moderator for 30th Americas Conference on Information Systems (AMCIS), Salt Lake City, Utah, August 2024.

## Peer Mentor for:

• Served as a peer mentor at the University of Arkansas at Little Rock (UALR) between 2023-2024, assisting graduate students in navigating coursework, balancing academic and personal responsibilities, and achieving successful degree completion.

## **Reviewer for:**

- HICSS- Hawaii International Conference on System Sciences -- 2024, 2025
- SBP-BRIMS- International Conference on Social Computing, Behavioral-Cultural Modeling & Prediction and Behavior Representation in Modeling and Simulation -- 2022, 2023, 2024
- ASONAM- International Conference on Advances in Social Networks Analysis and Mining

   2023
- CySoc International workshops on cyber social threats -- 2023, 2024
- SNAM Social Network Analysis and Mining -- 2024

## Students mentored:

- Adeola Adesoba, MS. in Information Quality, Fall 2021
- Ugochukwu Onyepunuka MS. in Information Science, Spring 2023
- Ivory Okeke Ms. in Business Information Systems & Analytics, Spring 2023
- Connice Trimmingham MS. in Computer Science, Fall 2022
- Ifeanyi Joshua Umoga MS. in Information Science, Spring 2023

# **Tutorial and Poster Presentations**

- 1. COSMOS Social Media Analysis Training. Tutorial on data collection and collection action research projects, September 26-28, 2024
- 2. Nitin Agarwal, **Mainuddin Shaik** and Manohar Koya. Tutorial on 'Social Network Analysis' for WVAR-CRESH summer school on AI and Smart Health-2023, West Virginia University, July 2023.

3. Presented Poster at SBP-BRiMS 2023 and SBP-BRiMS 2024 conferences in Carnegie Mellon University regarding 'Multimedia Roles in Social Movements and Collective Action'

#### Invited Talks/Presentations

- 1. Delivered a talk on "**Social Computing and the State of Research on Social Media**" at the Computer and Information Science Department, UALR, for all graduate students, upon the request of the Department Chair on September 21, 2023.
- 2. Delivered a talk for "**New International Graduate Students**" at UALR for all graduate students, upon the request of the Graduate School Dean on August 17, 2023.

#### Newsletters and Press

- 1. Mentioned in "COSMOS Researchers Present at HICSS 2024," published by <u>COSMOS/UA Little Rock News</u> on January 10, 2024.
- Mentioned in "Guiding the Future: COSMOS PhD Student Now Peer Mentor for the Academic Affairs Retention Office at UALR," published by <u>COSMOS/UA Little Rock</u> <u>News</u> on January, 2024.
- 3. Mentioned in "COSMOS Researchers Present Multimedia Emotion Assessment Studies at ICMIP 2024," published by <u>COSMOS/UA Little Rock News</u> on April, 2024.
- 4. Mentioned in "COSMOS Students Shine at DCSTEM Spring 2024 Awards," published by <u>COSMOS/UA Little Rock News</u> on May 6, 2024.
- 5. Mentioned in UALR Researchers present findings for NATO conference published by Arkansas Business, news wise and <u>UA Little Rock News</u> on November 14, 2016.

#### References

Available upon request.