Sana Amjad
Researcher, Teacher
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EDUCATION

- **COMSATS University Islamabad** — *Islamabad, Pakistan*
  Masters f Science in Software Engineering — *Jan. 2019 – Feb. 2022*
  Bachelor of Science in Software Engineering — *Feb. 2015 – Jan. 2019*

EXPERIENCE

- **Austrian Blockchain Center** — *Vienna Austria*
  Junior Researcher — *Oct. 2022 – Current*

  – Designed and implemented a user-centric, blockchain-based document workflow system to support ESG compliance. Focused on role-based interactions, decision flows, and trust-building in decentralized digital ecosystems through intuitive UI and verifiable audit trails.
  – Developed a token-based incentive mechanism as part of the Youth Agency Marketplace initiative with UNICEF, aimed at engaging users in citizen science tasks while exploring trust dynamics and behavioral motivation in decentralized digital ecosystems.
  – Conducted an in-depth analysis of blockchain connection patterns in the IoT Project, identifying structural trends and communication dynamics with implications for decentralized network optimization. The findings were published in a peer-reviewed article.
  – Contributed to the Applied CPS European Digital Innovation Hubs project by conducting comprehensive system testing of the EDIH platform, validating functionality and user experience against defined test scenarios. Successfully onboarded new users and collected feedback to enhance platform usability and engagement.
  – In the Data Provider Web3 FFG Project, conducted a comparative analysis of blockchain explorers, focusing on their integrated security tools, feature sets, and architectural differences. Assessed security functionalities and reporting mechanisms across platforms.
  – Contributed to a research proposal focused on designing an AI-powered, model-driven recommendation system to support the adoption and deployment of blockchain technologies in supply chain processes, emphasizing technological fit, implementation readiness, and process optimization.
  – Tools & Technologies: Design Science Research, Case Study, Blockchain (EVM-Based, Hyperledger Fabric), Frontend/Backend Development, Federated Learning, Solidity, MATLAB, TypeScript, JavaScript, Express, Vue.js, Node.js, Html, CSS, LaTeX, Git, Docker, Postman, RESTful, Web3, Zero-Knowledge Proofs

- **SZABIST University** — *Islamabad Pakistan*
  Lecturer — *Apr. 2022 – Oct 2022*

  – I taught undergraduate Computer Science students for one semester and delivered lectures.

  – I supervised final-year Bachelor's students in their final-year projects, providing guidance on project design, implementation, and documentation.

- **ComSens Lab, COMSATS University Islamabad** — *Islamabad Pakistan*
  Research Assistant — *Feb. 2020 – Apr 2022*

  – Contributed to the design and development of a blockchain-based authentication and secure data storage system for Wireless Sensor Networks (WSNs). Integrated a hybrid system using a private blockchain, IPFS, and AES encryption to ensure efficient, tamper-proof node registration and incentivized data storage.
  – Introduced a DDR-LEACH-based routing protocol and a CNN-driven malicious node detection model using RMCV-based trust evaluation.
  – Conducted simulations and security evaluations against attacks such as gray hole and flooding, and co-authored multiple international conference publications on blockchain-enabled WSN security.
  – Published and presented findings at IEEE-indexed conferences including CISIS and IMIS, and Journals including MDPI, and IEEE Access, focusing on decentralized trust, secure routing, and blockchain-based identity authentication for IoT.

– Assisted in producing research papers by mentoring students through ideation, literature review, and methodology refinement.

– Helped students identify limitations in their research work and guided them toward feasible and novel contributions.

– Provided technical support in the implementation of student projects, including prototyping and experimentation.

– Reviewed student-written articles for structure, clarity, and technical accuracy; supported the publication process through journal selection and formatting guidance.

– Supervised and co-mentored Master's students under faculty supervision on blockchain, IoT, and security-related topics.

– Conducted assessments including quizzes, assignments, and exams; ensured fair evaluation and academic integrity.

– Tools & Technologies: Ethereum, Ganache, IPFS (InterPlanetary File System), AES (Advanced Encryption Standard), Homomorphic Encryption, Asymmetric Encryption, Machine Learning, Deep Learning, Python, Scikit-learn, Keras, RMCV (Recommendation Model with Cluster-based Verification), Heuristic, Metaheuristic, Scheduling.

LECTURES

- **Security and Privacy,** SZABIST University, Islamabad Pakistan — *Apr. 2022 – Oct 2022*
- **Data Structures,** SZABIST University, Islamabad Pakistan — *Apr. 2022 – Oct 2022*
- **Application of Data Science,** SZABIST University, Islamabad Pakistan — *Apr. 2022 – Oct 2022*
- **Software Development,** SZABIST University, Islamabad Pakistan — *Apr. 2022 – Oct 2022*
- **Research Methodology,** COMSATS University, Islamabad Pakistan — *Feb. 2020 – Apr 2022*

SKILLS

AI/ML: Model training, preprocessing, Scikit-learn, Keras, TensorFlow
Programming: Python, Java, Solidity, MATLAB, TypeScript, JavaScript, Express, Vue.js, Node.js, Html, CSS, LaTeX
AI Infrastructure: GPU-based training (NVIDIA), CUDA basics
Containers & Virtualization: Docker, Kubernetes, Virtual environments, Amazon AWS, Blockchain, MySQL
Version Control: Git, GitHub (branches, merges)
Operating Systems: Linux (Ubuntu), Windows
Tools: Jupyter, VS Code, API-based ML workflows, Postman, Oyente
Data Processing: Pandas, NumPy, Matplotlib
Prototyping: Research prototype development **Spoken languages:** Urdu (native), English (fluent), German (A2)
APIs: RESTful, Web3
Soft Skills: Teamwork, Leadership, Time Management, Public Presentation, Coaching, and Mentoring

PUBLICATIONS

1. **Sana Amjad**, Shahid Abbas, Zain Abubaker, Mohammed H. Alsharif, Abu Jahid and Nadeem Javaid "Blockchain-Based Authentication and Cluster Head Selection Using DDR-LEACH" published in **Internet of Sensor Things, 2 March 2022, MDPI Sensors.**

2. Zahoor Ali Khan, **Sana Amjad**, Farwa Ahmed, Abdullah M. Almasoud, Muhammad Imran, Nadeem Javaid "A Blockchain-Based Deep-Learning- Driven Architecture for Quality Routing in Wireless Sensor Networks", **Published: 21 March 2023, IEEE Access.**

3. **Sana Amjad**, Stefan Craß, "Blockchain-based Token Platform for Incentivizing Citizen Science: case of the YOMA reward tokens", is published in **7th International Conference on Blockchain Computing and Applications (BCCA 2025).**

4. **Sana Amjad**, Stefan Craß, Alfred Taudes, Davor Stevenovic, 'Privacy and Security Requirements Challenges in Blockchain-Based Decentralized Federated Learning" , published in **International Workshop on Requirements Engineering for Web3 systems (RE) June, 2024.**

5. Shahid Abbas, **Sana Amjad**, Stefan Craß, Amid Moeinzadeh 'Analysis of Blockchain Connection Patterns", published in **IEEE Cybermatics SmartData 2024.**

6. **Sana Amjad**, Usman Aziz, Muhammad Usman Gurmani, Saba Awan, Maimoona Bint E Sajid and Nadeem Javaid, "Blockchain based Authentication for end-nodes and efficient Cluster Head selection in Wireless Sensor Networks", in the **15th International Conference on Complex, Intelligent and Software Intensive System (CISIS), 2021.**

7. Abid Jamal, **Sana Amjad**, Usman Aziz, Muhammad Usman Gurmani, Saba Awan and Nadeem Javaid, "A Privacy Preserving Hybrid Blockchain based Announcement Scheme for Vehicular Energy Network", in the **15th International Conference on Complex, Intelligent and Software Intensive System (CISIS), 2021.**

8. Saba Awan, Maimoona Bint E Sajid, **Sana Amjad**, Usman Aziz, Usman Gurmani, Nadeem Javaid "Blockchain based authentication and trust evaluation mechanism for secure routing in wireless sensor networks", published in the **15th International Conference on Innovative Mobile and Internet Services in Ubiquitous Computing (IMIS-2021).**

9. Usman Aziz, Muhammad Usman Gurmani, Saba Awan, Maimoona Bint E Sajid, **Sana Amjad**, Nadeem Javaid "A blockchain based secure authentication and routing mechanism for wireless sensor networks", published in the **15th International Conference on Innovative Mobile and Internet Services in Ubiquitous Computing (IMIS-2021).**

REFERENCES

Prof. Dr. Alfred Taudes
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Vienna University of Economics and Business
Vienna, Austria

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