

RANA ZEESHAN

COMPUTER SCIENCE RESEARCHER | Data Governance | Distributed Systems | AI / LLM / NLP

Technology-Driven Research in Digital Data Collection, Utilisation and Governance

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PROFESSIONAL SUMMARY

Computer Science researcher with multidisciplinary experience in digital data governance, secure and distributed data architectures, blockchain-based storage and provenance, privacy-aware data handling, AI/LLM-enabled workflows, and proof-of-concept software development. PhD research focused on digital innovation in sensitive healthcare data handling, including Hyperledger Fabric, hybrid on/off-chain storage, access control, encryption, provenance and consensus design. Current applied research includes LLM/API-integrated digital-health prototyping, technical feasibility assessment, usability-focused testing and iterative software development. Experienced in peer-reviewed publication, research ethics, PPI (Public and Patient Involvement in Research), technical reporting and interdisciplinary stakeholder engagement.

CORE COMPETENCIES

Research, Experimentation & Prototyping: Proof-of-Concept Implementations; Experimental Evaluation; Usability Assessment; Literature Review; Interviews; Surveys; Data Analysis; Technical Reports; Grant Applications; Research Dissemination

Data Governance, Privacy & Trust: Data Governance; Data Provenance; Privacy-Aware Data Handling; Access Control (RBAC/ABAC); Research Ethics; Secure Data Workflows; Compliance-Oriented Design

Distributed Systems & Blockchain: Hyperledger Fabric; Hybrid On/Off-Chain Storage; Chaincode; Consensus Design; AES-256-GCM; RSA-OAEP; Distributed Ledger Architectures

AI, NLP & Speech Technologies: Large Language Models; NLP; Automatic Speech Recognition (ASR); Speech-to-Text; Speaker Diarisation; Information Extraction; Summarisation; Structured Prompting; AI/LLM APIs

Software Development & Data Tools: JavaScript; Node.js; HTML; CSS; Bootstrap; MySQL; Web Portals; Admin Dashboards; Interactive Prototypes; API Integration; R; Tableau; Data Visualisation

Collaboration & Knowledge Exchange: Interdisciplinary Research; Industry-Facing Projects; Patient and Public Involvement (PPI); Workshops; Presentations; University Teaching; Training and Student Support

EDUCATION

PhD in Computer Science | 2022 - 2026

College of Science and Engineering | University of Galway, Ireland

- Thesis: Digital Innovation in Psychiatric Data Handling Practices in Irish Mental Health Services.
- Research included AI-enabled data collection/utilisation, blockchain-based storage and governance, privacy, access control, distributed trust mechanisms, and prototyping for usability studies.

MSc Computing (Blockchain) | 2020 - 2022

School of Computing | Dublin City University (DCU), Ireland

BSc Computer Engineering | 2010 - 2014

Engineering Department | COMSATS CIIT, Lahore, Pakistan

PROFESSIONAL EXPERIENCE

Research Associate | 2026 - Present

Data2Sustain / European Digital Innovation Hub (EDIH), Digital Healthcare | University of Galway

- Conduct applied research and proof-of-concept prototype development for an AI-assisted digital-health coaching platform, translating research requirements into functional software workflows.
- Develop and test LLM/API-integrated conversational functionality, including structured prompt workflows, speech-to-text/text-to-speech integration and database-backed session management.
- Contribute to prototype testing, usability-oriented evaluation, pseudonymised data handling, human oversight and iterative refinement with project stakeholders.
- Build on an earlier feasibility phase evaluating multiple LLM platforms for conversational quality, prompt adherence, safety behaviour, latency, cost and implementation practicality.

Researcher | Mar 2026 - Apr 2026

Data2Sustain / European Digital Innovation Hub (EDIH), Digital Healthcare | University of Galway

- Conducted technical feasibility assessment for an AI-assisted coaching concept supporting people living with persistent/chronic pain.
- Developed API-integrated proof-of-concept implementations and compared multiple LLM platforms across prompt adherence, conversational quality, safety behaviour, latency, cost and STT/TTS integration.
- Produced evidence to inform the subsequent prototype-development phase and technology-selection decisions.

Computing Assistant | Oct 2024 - Jul 2025

ISS Service Desk | University of Galway

- Provided technical support to staff and students through a ticketing-system environment, supporting issue resolution, communication and service continuity.

Teaching Assistant | Sep 2022 - Apr 2026

University of Galway

- Supported teaching and practical learning in Cybersecurity, Object-Oriented Programming (Java) and Web Programming.
- Assisted students with technical problem-solving, laboratory activities and coursework.

Assistant Lecturer | Sep 2021 - Jun 2022

TU Dublin

- Delivered teaching support in Dynamic Programming Languages and contributed to student learning and assessment activities.

Research Assistant | Jun 2021 - Dec 2021

Lambe Institute, School of Medicine | University of Galway

- Supported interdisciplinary research activities within a medical research environment.

Front-End Web Developer | May 2015 - Jul 2019

LinksLine IT Solutions | TeleCare IT Solutions

- Developed web interfaces and frontend functionality using HTML, CSS, JavaScript, Bootstrap and related web technologies.

Web Design Trainer - Part Time | Feb 2017 - Jul 2019

TeleNoc & Knowledge Core Institute | IT Skill Development

- Delivered web-design training and supported learners in practical development skills.

SELECTED RESEARCH & TECHNICAL PROJECTS

AI-Assisted Digital Health Coaching Platform | [Current Applied Research / PoC Development](#)

Data2Sustain / European Digital Innovation Hub (EDIH) | University of Galway

- Developing and evaluating an LLM/API-integrated coaching PoC with structured prompting, speech-to-text/text-to-speech integration, database-backed session management, pseudonymised data handling, human oversight, safety checks and usability-focused refinement.

Blockchain-Enabled Hybrid Storage and Trust Framework for Secure Data Provenance | [PhD Research / Manuscript](#)

University of Galway

- Designed a Hyperledger Fabric-based hybrid on/off-chain governance model incorporating RBAC/ABAC, AES-256-GCM, RSA-OAEP, provenance controls and consensus/trust refinements including SigQuorum-RAFT.

PsyNote Pro | [PhD Research / PoC Prototype](#)

University of Galway

- Developed a transcript-to-documentation PoC prototype using LLM-assisted structured prompting and automated information organisation to support digital clinical documentation workflows.

ASR, Speech-to-Text and LLM-Based Speaker Diarisation | [PhD Research](#)

University of Galway

- Evaluated automatic speech-recognition platforms for transcription and investigated text-based LLM speaker diarisation as a privacy-aligned downstream workflow for merged transcripts.

Technical Usability Assessment of Security Analysis Tools for Ethereum-Based Smart Contracts | [Research Project / IEEE Publication](#)

- Evaluated smart-contract security analysis tooling from a technical usability perspective, building on blockchain development, Ethereum and security-analysis experience.

Earlier Blockchain, Security & Data Projects

- Hyperledger-Based Reliable Plot Files' Allocation Solution for South Asian Real Estate.
- Review of Common Vulnerabilities in Smart Contracts.
- Application of Blockchain in Reputation Systems.
- Spotify Dataset-Based Songs Recommender using audio attributes as parameters (Tableau / Cloud Computing).
- Blockchain for Data Science - Critical Précis.
- Ethical Analysis - An Unconventional Phishing Attack.
- Differential Cryptanalysis of the FEAL-4 Block Cipher.

PUBLICATIONS & MANUSCRIPTS

- Blockchain-Enabled Hybrid Storage and Trust Framework for Secure Psychiatric Data Provenance. *Submitted journal paper - CMPB, 2026*
- Beyond ASR: Achieving Privacy-Aligned Low Diarization Error Rates in Psychiatric Transcripts using LLMs. *Published conference paper - IEEE, 2025*
- Relative applicability of diverse automatic speech recognition platforms for transcription of psychiatric sessions. *Published journal paper - IEEE, 2025*
- Pursuit of Digital Innovation in Psychiatric Data Handling Practices in Ireland - A Comprehensive Case Study. *Published journal paper - JMIR, 2025*
- Technical Usability Assessment of Security Analysis Tools for Ethereum-Based Smart Contracts. *Published conference paper - IEEE, 2023*
- PsyNote Pro: Quantifying LLM-Assisted Workload Optimisation in Irish Psychiatric Care. *Submitted journal paper - JHIR, 2026*

ADDITIONAL INFORMATION

English Language: IELTS 7.5

Work Authorisation: Stamp 4; full work permission in Ireland.

Driving: Full driver's licence