

Komal Khan

Energy Management | Sustainability & Grid Resilience | Smart Grid Technologies

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PROFILE

Researcher at the forefront of the clean energy revolution, specializing in cutting-edge technologies driving the transition to a net-zero future. Specialized in peer-to-peer energy trading, blockchain applications for grid decarbonization, and AI-powered multi-agent systems for smart grid optimization. Pioneering research in electric vehicle charging management to accelerate transportation electrification and grid integration. Passionate about leveraging digital innovations to transform the power industry, enhance energy efficiency, and catalyze the shift towards a sustainable, decentralized energy ecosystem. Committed to developing solutions that address environmental, social, and governance (ESG) criteria in the energy transition.

WORK EXPERIENCE

Energy Market Strategy Researcher - Power Distribution Networks

Lemur Research Group, Gijón, Spain | Feb 2020 – Present

- Conducted in-depth electricity market research and developed load management strategies for Spanish distribution networks, directly contributing to the optimization of Spain's electrical grid.
- Built dynamic price mechanisms and peer-to-peer energy trading platforms, aligning with Spain's evolving energy market regulations, particularly those related to renewable integration and grid modernization.
- Spearheaded development of frameworks for strategic analysis of the renewable's integration on Spanish electrical distribution networks under various scenarios.

International Research Collaborator – Sustainable Energy Systems

NTNU Norway | Oct - Dec 2022

- Led international research efforts on blockchain-enabled energy applications, resulting in co-authored publications on innovative smart contract frameworks.
- Designed industry-standard technology stacks for energy market applications, addressing technical and operational challenges.
- Conducted sustainability-driven research aligned with policy recommendations and regulatory compliance for advancing energy management practices. evolving business goals and operational efficiency.

IoT and Blockchain Solutions Developer – Smart Energy Systems

Smart Cities Demo Lab, Gijon Spain | Feb – Sept 2019

- Designed and implemented a peer-to-peer energy trading system integrating IoT and blockchain technologies, driving energy management transformation.
- Delivered a functional pilot project, achieving improved renewable energy utilization and cost reductions for urban communities while advancing digital energy solutions.

Technical Project Lead – Mobile Banking Solutions

Mobilink, Islamabad Pakistan | Nov 2015 -17

- Directed technical project lifecycle phases for 20+ corporate clients, achieving a 95% satisfaction rate through process optimization and technology-driven solutions.
- Streamlined processes for incentive-based schemes, improving operational efficiency and engagement metrics through innovative digital tools.

KEY SKILLS

Analysis Tools

Python (Simulation & Modelling, Data: Analysis,Visualization, Wrangling, Image & Video Analysis, and Machine Learning)
R (Statistical Analysis)
MATLAB (Simulation & Modelling)
Blockchain and Smart Contracts Development (Solidity)
WebRTC, MQTT (Communication Protocols)

Office Automation

PowerBI (Data Analysis and Visualisation)
Advanced PowerPoint (Executive Presentations, , Graphic Designing)
Project Management Tools (MS Project, Trello, Jira, Miro)

- **Soft skills:** Strategic thinking, project leadership, analytical problem-solving, cross-cultural communication, adaptability, executive presentation and report-writing skills, and team collaboration.
- **Languages:** English (C2 Level), Spanish (Basic), Urdu (Native)

EDUCATION

PhD in Energy and Process Control | GP: 10 / 10 Cum Laude
University of Oviedo, Spain | 2024

- Research Topic: Local energy market (LEM) based peer-to-peer energy trading in low voltage (LV) distribution networks

MSc STEPS - Sustainable Transportation and Electrical Power Systems | GP: 8.65 / 10
EU Erasmus Mundus Joint Masters Degree | 2019

- Multi-institutional program: University of Oviedo [Spain], University of Nottingham [UK], University of Coimbra [Portugal]

SELECTED PUBLICATIONS

Published 10+ peer-reviewed papers on renewable energy projects, energy storage solutions, and smart grid technologies.

[Electric Power Systems Research \[Journal\]](#)

"A Multi-Agent Framework for Coordinating One-to-Many Concurrent Composite Negotiations in a Multi-Stage Postpaid P2P Energy Trading Model", 2024

[IEEE Transactions on Vehicular Technology \[Journal\]](#)

"Multi-issue negotiation EVs charging mechanism in highly congested distribution networks", 2022

CERTIFICATIONS AND HONORS

- AI and Data Science with Python Certification
- Certified Blockchain and Digital Transformation Specialist
- Awarded "Severo Ochoa" Pre-Doctoral Research Grant
- Competitively selected under Erasmus+ EMMC STEPS

PROFESSIONAL ACTIVITIES

- Speaker at Google Women Tech Makers Asturias: Presented **AI and IoT based Digital Transformation** project "Voice control-based home automation system and a smart energy management".
- Workshop Facilitator: Node-Red Visual Programming for Youth Creative Jam under EU AYCH Project.
- Active Member: IEEE SA Smart Contract Task Force, contributing to blockchain standardization efforts.