

# Mohsin Khan

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**Summary:** PhD candidate in Cybersecurity at UiT (thesis submitted), specializing in lightweight cryptography and blockchain-based access control for IoT. Alongside my research, I have carried out pedagogical responsibilities and engaged in international collaboration and scholarly dissemination. I aim to contribute to NTNU through high-impact research and quality teaching across the cybersecurity curriculum.

## Education

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### UiT Norges Arktiske Universitet

Tromsø, Norway

#### Doctor of Philosophy in Cyber Security

Nov 2021 - Dec 2025 (Expected)

- **Title:** End-to-End Security for Resource-Constrained IoT Systems in Distributed Environments. 📄
- Improved end-to-end security for resource-limited IoT systems by integrating cryptography and blockchain-based capability control, resulting in a system that provides dynamic authentication and authorization.
- Contributed to computer security education by teaching core courses, examining master's theses, and engaging in curriculum development during my doctoral period.

**Advisors:** Prof. Håvard Johansen, Prof. Dag Johansen, Dr. Elisavet Kozyri

**Collaboration:** Dr. Davide Ferraris from NICS Lab, University of Malaga, Spain

### Indira Gandhi National Open University

New Delhi, India

#### MBA in Operations Management

Jan 2019 - Jul 2022

- **Title:** Impact of Management Information Systems (MIS) on Banking Efficiency 📄
- Investigated the role of Management Information Systems in enhancing banking operations through a statistical study at a state bank, yielding insights into governance and risk-aware decision support.

**Advisor:** Dr. Mohammad Ashraf Malla

### Central University of Jammu

J&K, India

#### M.Tech in Computer Science and Engineering

Aug 2018 - Nov 2020

- **Title:** Traffic Jam Minimization and Accident Avoidance System using IoT 📄
- Developed an IoT-enabled traffic congestion and accident-avoidance framework by designing a communication model based on real-time sensing and lane-shift logic, contributing to safety-critical IoT systems.

**Advisor:** Dr. Bhavna Arora

### Baba Ghulam Shah Badshah University

J&K, India

#### B.Tech in IT & Telecommunication Engineering

Aug 2014 - Jun 2018

- **Title:** Smart and Secure Home 📄
- Designed and implemented an IoT-based smart home system integrating sensing and automation on a single microcontroller platform, forming early practical experience with networked device interactions.

**Advisor:** Prof. Malik Mubasher Hassan

## Teaching & Professional Activities

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### Masters Examiner

Henrik Monsen

Spring 2024

Hauk Storjord

Spring 2025

Jørgen Kristensen

Spring 2025

## Teaching Duties

Computer Communications	Fall 2022, 23, 24
Computer Security	Spring 2022, 23
Advanced Distributed Systems	Spring 2024, 25
Privacy Preserving Computation	Fall 2025

## Professional Activities

Organizing committee member at the IEEE CCGrid Conference <a href="#">🔗</a>	May 2025
Organized PhD Seminars at UiT	Spring, Fall 2024

## Memberships

DLN – Digital Life Norway	Since 2023
INSTICC – Institute for Systems and Technologies of Information, Control and Communication <a href="#">🔗</a>	Since 2025
(ISC) <sup>2</sup> – International Information System Security Certification Consortium <a href="#">🔗</a>	Since 2025

## Schools and Workshops

<b>Finse Cyber Security Winter School</b> , University of Oslo, Norway <a href="#">🔗</a>	Apr 28 – May 2, 2021
<b>Reykjavík Secure Distributed Systems Summer School</b> , Ulm University, Germany <a href="#">🔗</a>	Jun 13 – Jun 24, 2022
<b>EuroSys Principles of Consistency for Distributed Data Workshop</b> , Rennes, France	Apr 5, 2022
<b>IoT Workshop (AICTE ATAL Academy)</b> , Central University of Jammu <a href="#">🔗</a>	Oct 14 – Oct 18, 2019
<b>AI Workshop (AICTE ATAL Academy)</b> , Central University of Jammu <a href="#">🔗</a>	Nov 18 – Nov 22, 2019

## Publications (Total - 12)

Conference - 6 | Journal - 4 | In Progress - 2

### Conference

<b>M Khan</b> , H Dagenborg, D Johansen <a href="#">🔗</a>	Accepted   NordSec 2025
A Comparative Analysis of Lightweight Hash Functions Using AVR ATXMega128 and ChipWhisperer	
<b>Keywords:</b> NIST, ISO/IEC 29192-5, ChipWhisperer, ATXmega128, Sponge Construction, E-RANK Metric	
<b>M Khan</b> , H Dagenborg, D Johansen <a href="#">📄</a>   <a href="#">🔗</a>	SECURITY 2025
Software Benchmarking of NIST Lightweight Hash Function Finalists on Resource-Constrained AVR Platform via ChipWhisperer	
<b>Keywords:</b> NIST, ChipWhisperer, ATXmega128, Sponge Construction, E-RANK	
AB Ovesen, <b>M Khan</b> , H Dagenborg and D Johansen <a href="#">📄</a>	FMEC 2025
System Support for Accountable and Trusted Data Collection and Fog Processing in Remote Electronic Monitoring	
<b>Keywords:</b> Edge Computing, Fog Processing, Remote Electronic Monitoring (REM), Data Provenance	
<b>M Khan</b> , D Johansen, H Dagenborg <a href="#">📄</a>   <a href="#">🔗</a>	SciSec 2024
Performance Evaluation of Lightweight Cryptographic Ciphers on ARM Processor for IoT Deployments	
<b>Keywords:</b> Lightweight Cryptography, ARM Processor, Software Performance	
A Samir, A Al-Wosabi, <b>M Khan</b> , H Dagenborg <a href="#">📄</a>	ESOCC 2023
A Multi-pronged Self-adaptive Controller for Analyzing Misconfigurations for Kubernetes Clusters and IoT Edge Devices	
<b>Keywords:</b> Kubernetes, Hierarchical Hidden Markov Models, Role-Based Access Control, IoT Edge Devices	
<b>M Khan</b> , B Arora <a href="#">📄</a>	ETCCS 2020
Traffic Jam Minimization and Accident Avoidance System Using IoT	
<b>Keywords:</b> Internet of Things (IoT), Level-2 Vehicle Automation, Phantom Jams	


## Journal

**M Khan**, E Kozyri, D Johansen, H Dagenborg  In Progress | IEEE Access  
DTES: A Distributed Trust Enforcement System for IoT Infrastructures

**Keywords:** Blockchain, CapBAC, Edge, Fog, Smart Contracts, PoA, Trust Enforcement, STRIDE

**M Khan**, E Kozyri, D Johansen, H Dagenborg In Progress | IEEE Access  
Systematic Review of Lightweight Cryptographic Algorithms


**Keywords:** Lightweight cryptography, symmetric & asymmetric ciphers, survey, comparative analysis

**M Khan**, E Kozyri, D Johansen, H Dagenborg  IEEE Access 2025  
Survey of Lightweight Hardware-Based Hash Functions for Security in Constrained IoT Devices

**Keywords:** Lightweight hash functions, IoT, hardware implementation, sponge and cipher-based construction

**M Khan**, H Dagenborg, D Johansen  |  Future Internet MDPI 2024  
Performance Evaluation of Lightweight Stream Ciphers for Real-Time Video Feed Encryption on ARM Processor

**Keywords:** Lightweight Stream Ciphers, IoT Security, Performance, E-RANK, Embedded Cryptography

**M Khan**, B Arora  IJACI IGI Global 2021  
Traffic Congestion Reduction and Accident Circumvention System via Incorporation of CAV and VANET

**Keywords:** IoV, Connected Automated Vehicles (CAV), Vehicular Ad Hoc Network (VANET), MATLAB/Simulink

MM Hassan, **M Khan**, et. al.  IJSRCSEIT 2018  
Smart n Secure Home Using IoT

**Keywords:** Internet of Things (IoT), RFID Access Control, Arduino, Remote Control, and Monitoring

## Talks and Presentations

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<b>NordSec, Tartu, Estonia</b> – Paper Presentation	12-13 Nov 2025
<b>SECRYPT, Bilbao, Spain</b> – Poster Presentation	11-13, June 2025
<b>SciSec, 14-16 Copenhagen, Denmark</b> – Paper Presentation	14-16, Aug 2024
<b>CSG Meeting, UiT, Tromsø, Norway</b> – Presentations. e.g., PQC	2023 – 2025
<b>Research Seminar, Dalarna University, Sweden</b> – Presentation on Lightweight Crypto	Oct 30, 2024
<b>ETCCS, Noida, India</b> – Paper Presentation	31 Jan - 1 Feb, 2019

## Work Experience

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**Blackbuck Insight** **Bangalore, India**  
*Data Engineer* *Jan 2021 – Nov 2021*

- Improved reliability and quality of structured and unstructured data pipelines by migrating workflows to AWS, applying IAM-based access controls, and monitoring operational performance, ensuring stable, analysis-ready datasets for downstream modelling and evaluation.
- Built and optimized distributed data processing workflows using PySpark, MapReduce, and Linux-based systems, enabling scalable data preparation and faster analysis across high-volume datasets in production environments.

## Technical Skills

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**Programming:** C, C++, Python, Bash, Solidity, MATLAB

**Cybersecurity:** Threat Modelling, Risk Assessment, Vulnerability Analysis, IAM, Secure System Design, Network & Wireless Security, Applied Cryptography

**Cryptography & Protocols:** Lightweight Cryptography, Information Flow Control (IFC), Access Control Models

**Embedded & IoT Security:** Raspberry Pi, Arduino, Jetson, AVR, ChipWhisperer, Sensor/Edge Security

**Cloud & DevSecOps:** AWS (EC2, S3, IAM), Docker, Kubernetes, CI/CD

**Tools & Frameworks:** Git, Linux CLI, VS Code, Microchip/AVR Toolchains, MATLAB/Simulink

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## Certifications

<b>AWS:</b> Amazon Web Services Certified Developer – Associate <a href="#">🔗</a>	Feb 2021
<b>Databricks:</b> Certified Associate Developer for Apache Spark 3.0 – Python <a href="#">🔗</a>	Apr 2021
<b>AICTE:</b> Real-Time Power System Analysis and Smart Grid <a href="#">🔗</a>	Mar 2019
<b>NCERT:</b> Educational Administration, Management & Leadership in School Education <a href="#">🔗</a>	May 2019

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## Achievements

**Best Paper Award:** “Smart n Secure Home using IoT,” presented at the National Conference on Recent Advances in Computer Science and IT (NCRACIT). [🔗](#)

**Certificate of Appreciation:** Awarded for exemplary performance in the university-level drawing competition at Baba Ghulam Shah Badshah University (BGSBU). [🔗](#)

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## Interests

**Sports:** Bodybuilding, Fitness Training, Strength Training

**Others:** Leadership, Management, Finance, Programming

**Languages:** Hindi, Urdu, English, Kashmiri (Native), Norwegian (Beginner – actively learning)

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## References

**Prof. Håvard Johansen**

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