

# Ankur Lohachab

PH.D. STUDENT · COMPUTER SCIENCE AND ENGINEERING

College of Sciences and Engineering – School of Information and Communication Technology  
University of Tasmania (UTAS), Hobart – 7005, Tasmania, Australia

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## Summary

Ph.D. Student with 5+ years of research experience in Distributed Computing and Information Security. Extensive background in Blockchain, Applied Cryptography, and Software Analysis. 2 years of experience in academic tutoring at the graduate level. Strong pedagogical, technical, and mentoring skills.

## Education

### School of Information and Communication Technology, University of Tasmania (UTAS)

Tasmania (Australia)

DOCTOR OF PHILOSOPHY (PH.D.) – INFORMATION TECHNOLOGY

2019 – Present

- **Subsidiary Course(s):** Graduate Certificate in Research (2019 – 2021), GPA: 6.50/7.00

### University Institute of Engineering and Technology (UIET), Kurukshetra University

Kurukshetra (India)

MASTER OF TECHNOLOGY (M.TECH.) – COMPUTER SCIENCE AND ENGINEERING

2016 – 2018

- **Result:** 9.43/10.00 CGPA, First Rank

### Kurukshetra University

Kurukshetra (India)

BACHELOR OF TECHNOLOGY (B.TECH.) – COMPUTER SCIENCE AND ENGINEERING

2011 – 2015

- **Result:** First Division

## Research Experience

### School of Information and Communication Technology, UTAS

Tasmania (Australia)

DOCTORAL RESEARCH

2019 – present

- **Research Topic:** Understanding and Advancing the Distributed Ledger Technology
- **Supervisors:** Dr. Saurabh Garg, Dr. Muhammad Bilal Amin
- **Brief Description:** Rigorous study of Blockchain systems' aspects, including interoperability and tokenization, for addressing architectural mismatch and inter-connectivity concerns among different blockchains via provisioning of a multi-formalism basis for analyzing common elements across distinctive architectures
- **Current Status:** Thesis writing in progress

### UIET, Kurukshetra University

Kurukshetra (India)

RESEARCH ASSOCIATE

2018 – 2019

- **Research Topic:** Blockchain Technology and Smart Health Care based Applications
- **Supervisor:** Dr. Ajay Jangra
- **Brief Description:** Explored the role of smart contracts for automatizing the controlled resource access in the Health Care ecosystem and how patient's history can be transparently tracked and communicated among authorized actors. As its sidelines, designed a smart walking stick prototype, integrating a Raspberry Pi-connected different sensors with a regular stick to assist elderly and visually impaired people

### UIET, Kurukshetra University

Kurukshetra (India)

POST-GRADUATE RESEARCH

2017 – 2018

- **Research Topic:** Inter-device Authentication and Authorization Mechanism for Internet of Things (IoT) Networks
- **Supervisor:** Dr. Karambir Bidhan
- **Brief Description:** Designed and developed an authorization framework and authentication protocol for Internet-of-Things (IoT) network using Elliptical Curve Cryptography (ECC); Formally expressed and verified security properties in AVISPA tool; Utilized RBAC and UCON models for authorization, along with ACPT tool for XACML-based security policies generation, verification, and testing

## Publications

## REFEREED JOURNALS

- Lohachab, A.,** Garg, S., Kang, B. H., Amin, M. B., Lee, J., Chen, S., & Xu, X. (2021). *Towards Interconnected Blockchains: A Comprehensive Review of the Role of Interoperability among Disparate Blockchains*. ACM Computing Surveys (CSUR), 54(7), 1-39.
- Lohachab, A.,** Garg, S., Kang, B. H., & Amin, M. B. (2021). *Performance Evaluation of Hyperledger Fabric-enabled Framework for Pervasive Peer-to-peer Energy Trading in Smart Cyber-Physical Systems*. Future Generation Computer Systems, 118, 392-416.
- Lohachab, A.,** Lohachab, A., & Jangra, A. (2020). *A Comprehensive Survey of Prominent Cryptographic Aspects for Securing Communication in Post-quantum IoT Networks*. Internet of Things, 9, 100174.
- Lohachab, A.** (2019). *ECC based Inter-device Authentication and Authorization Scheme using MQTT for IoT Networks*. Journal of Information Security and Applications, 46, 1-12.
- Lohachab, A.,** & Karambir, B. (2018). *Critical Analysis of DDoS—an Emerging Security Threat over IoT Networks*. Journal of Communications and Information Networks, 3(3), 57-78.

## INTERNATIONAL CONFERENCES

- Lohachab, A.,** & Jangra, A. (2019, April). *Attribute-Based Deterministic Access Control Mechanism (AB-DACM) for Securing Communication in Internet of Smart Health Care Things*. In International Conference on Advances in Computing and Data Sciences (pp. 231-243). Springer, Singapore.
- Lohachab, A.,** & Jangra, A. (2019, March). *Opportunistic Internet of Things (IoT): Demystifying the Effective Possibilities of Opportunistic Networks Towards IoT*. In 6th International Conference on Signal Processing and Integrated Networks (SPIN) (pp. 1100-1105). IEEE.
- Lohachab, A.,** & Lohachab, A. (2019, February). *Implication of Information-Centric Approach for Efficient Networking: Named Data Networking of Things (NDNoT) for Breaking out of Internet Protocol (IP)*. In Proceedings of International Conference on Sustainable Computing in Science, Technology and Management (SUSCOM).
- Lohachab, A.** (2018, April). *Using Quantum Key Distribution and ECC for Secure Inter-Device Authentication and Communication in IoT Infrastructure*. In Proceedings of 3rd International Conference on Internet of Things and Connected Technologies (ICIoTCT) (pp. 26-27).
- Lohachab, A.** (2018, February). *Next Generation Computing: Enabling Multilevel Centralized Access Control using UCON and CapBAC Model for securing IoT Networks*. In International Conference on Communication, Computing and Internet of Things (IC3IoT) (pp. 159-164). IEEE.

## BOOK CHAPTERS

- Lohachab, A.** (2022). *Bootstrapping Urban Planning: Addressing Big Data Issues in Smart Cities*. In Research Anthology on Big Data Analytics, Architectures, and Applications (pp. 1329-1358). IGI Global.
- Lohachab, A.** (2021). *A Perspective on using Blockchain for ensuring Security in Smart Card Systems*. In Research Anthology on Blockchain Technology in Business, Healthcare, Education, and Government (pp. 529-558). IGI Global.

## UNDER REVIEW

- Lohachab, A.,** Garg, S., & Amin, M. B. (2021). *OClient: On-board Client Clustering to Bridge the Interaction Gap across Multi-fabric Adaptive Ecosystem*.
- Lohachab, A.,** Garg, S., Amin, M. B., Ranjan R., & Zomaya Y. A. (2022). *A Review on the Feasibility of Interplay between Blockchain and Tactile Internet*.
- Lohachab, A.,** Garg, S., & Amin, M. B. (2022). *Holistic Assessment of Tokenization-oriented Smart Contracts using Multi-formalism*.

## Professional Experience

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- Sep 2018 – Sep 2019 **Research Associate**, UIET, Kurukshetra University
- Aug 2015 – Jul 2017 **Co-Founder and Developer**, LearnersCan – A non-profitable web platform for education and learning

## Teaching Experience

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- Feb 2021 – Present **Academic Tutor**, UTAS, Hobart Campus, Australia
- Data Management Technology (KIT712), Semester 1 and 2
  - Operating Systems (KIT213), Semester 2
  - eLogistics (KIT710), Semester 1

## Skill Profile

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**Design and Development:** Hyperledger Fabric, Ethereum, Eclipse Framework, Alloy Analyzer, AVSIPA, Hyperledger Caliper, Docker, ACPT, Content Management System (CMS)

**Programming Languages:** C, C++, Python, Java, Solidity

**Database:** MySQL, NoSQL, CouchDB, LevelDB

**Network Analysis:** Nmap, Wireshark

**Areas of Interests:** Information Security (5+ yrs.), Distributed Computing (5+ yrs.), Blockchain (4+ yrs), Web Development (4+ yrs.)

**Languages Spoken:** English (Professional), Hindi (Native)

## Academic & Industrial Projects

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**Tweet Sentiment Analysis** – Data Streaming Application, Platform: Docker, Programming Language: Python

**Automated Time-table Management for College Staff** – Platform: Eclipse, Programming Language: Java

**Fuzzy World** – Web Outreach Platform (B.Tech. 7th Semester, Industrial Training), Front End: ASP.NET, Middleware: C#, Back End Database: SQL Server

**IT Park** – Web Recruitment Platform (B.Tech. 5th Semester, Industrial Training), Front End: ASP.NET, Middleware: C#, Back End Database: SQL Server

## Awards & Grants

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- 2020 **Google Cloud Credit Grant**, Google LLC
- 2019 **Tasmania Graduate Research Scholarship (3.5 yrs.)**, UTAS
- 2018 **First Position**, M.Tech., Computer Science and Engineering, UIET, Kurukshetra University

## Contributed Presentations

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**Lohachab, A.** *Interoperability framework for inclusive development of Blockchain*. Poster: 3RD Future-IoT PhD School 2020 - IoT Meets Security. Technical University of Munich (TUM) (Germany) and IMT Atlantique (France), Strasbourg, France (Virtual), October 7, 2020.

## Outreach & Professional Development

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### SERVICE AND OUTREACH

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| 2021 | <b>IEEE/ACM International Conference on Automated Software Engineering (ASE)</b> , Student Volunteer                                 | Melbourne (Australia) |
| 2017 | <b>Short-Term Course (STC) on Cloud Computing and Internet of Things</b> , UIET, Kurukshetra University, Organizing Committee Member | Kurukshetra (India)   |
| 2017 | <b>Workshop on SWEBOK based foundation</b> , UIET, Kurukshetra University, Student Volunteer   | Kurukshetra (India)   |

### INDUSTRIAL TRAININGS, INTERNSHIPS, AND SUMMER SCHOOLS

**3RD Future-IoT PhD School 2020 – IoT Meets Security** (15 Hours, 2020), TUM (Germany) and IMT Atlantique (France), Strasbourg, France (Virtual)

**Internship in Java** (Dec 2015 – Mar 2016), Mahajan Computers, Kurukshetra, India (In association with Sun Web Technologies Pvt. Ltd., Chandigarh)

**Training in ASP .Net with C#** (8 Weeks, 2014), Mahajan Computers, Kurukshetra, India (In association with Sun Web Technologies Pvt. Ltd., Chandigarh)

**Project Training in Collaboration & Network** (80 Hours, 2013), HCL CDC, Chandigarh, India

**Project Internship in .NET** (80 Hours, 2013), HCL CDC, Chandigarh, India

## **COURSES AND WORKSHOPS**

### **With Focus on Information and Cyber Security**

- SISION-2018. STC on Security Issues for Sensor, IoT and Opportunistic Networks at National Institute of Technology (NIT) Kurukshetra, Sep 10-15, 2018.
- NIGS-2018. STC on Networking of IoT (Device to Gateway) & Security (A Boot Camp) at NIT Kurukshetra, Feb 16-20, 2018.
- RDCIoT-2017. STC on Recent Developments and Challenges in Internet of Things Security at NIT Kurukshetra, Jul 3-8, 2017.
- CSCTFP-2017. National workshop on Cyber Security: Current Trends and Future Perspective at NIT Kurukshetra, Mar 1-3, 2017.
- CyberSec-2016. Workshop on Cyber Security: Innovations and Opportunities at NIT Kurukshetra, Feb 12-13, 2016.
- STC on Recent Trends in Network Security at Indian Institute of Technology (IIT) Roorkee, Feb 1-5, 2016.
- Certified Information Security Specialist (CISS) – Cyber Forensics Workshop conducted by CyberCure Technologies Pvt. Ltd. in association with IEEE Delhi Technological University (DTU), Delhi, Oct 10-11, 2015.
- Cyber Security and Its Ten Domains by University System of Georgia on Coursera, Jun 19, 2015.
- Tryst 2015. Workshop on Ethical Hacking at IIT Delhi, Mar 1-2, 2015.

### **With Focus on Programming Languages and Technologies**

- Introduction to Data Science in Python by University of Michigan on Coursera, Apr 2019.
- Docker Essentials: A Developer Introduction (CO0101EN) by IBM on Cognitive Class, Dec 2018.
- Open Source Tools for Data Science by IBM on Coursera, Dec 2018.
- Introduction to Programming with MATLAB by Vanderbilt University, Nashville on Coursera, Sep 2015.
- Short Term Training Program on Cloud Computing at Maulana Azad National Institute of Technology, Bhopal, Mar 28-29, 2015.
- One week National Workshop on Problem solving using MATLAB at Maharishi Dayanand University (MDU), Rohtak, Mar 24-29, 2014.

### **With Focus on Blockchain**

- Blockchain, a 4-course specialization by The State University of New York & University at Buffalo on Coursera, May 2019.
- Decentralized Applications (Dapps) by University at Buffalo & The State University of New York on Coursera, May 2019.
- Blockchain Platforms by University at Buffalo & The State University of New York on Coursera, May 2019.
- Smart Contracts by University at Buffalo & The State University of New York on Coursera, May 2019.
- IBM Blockchain Essentials (BC01010EN) by IBM on Cognitive Class, Dec 2018.
- Blockchain Basics by University at Buffalo and The State University of New York on Coursera, Oct 2018.

### **With Focus on Academic Research**

- Mentoring in Peer Review by Web of Science Academy, May 2021.
- Reviewing in the Sciences by Web of Science Academy, May 2021.
- An Introduction to Peer Review by Web of Science Academy, May 2021.
- Good Citation Behavior by Web of Science Academy, May 2021.

- Co-reviewing with a Mentor by Web of Science Academy, May 2021.
- Workshop on Research Methodology: An Applied Orientation at NIT Kurukshetra, Mar 12-16, 2018.
- Communication in the 21st Century Workplace by University of California, Irvine on Coursera, Jul 2015.

## PEER REVIEW

IEEE Transactions on Information Forensics and Security  
 IEEE Transactions on Vehicular Technology  
 IEEE Transactions on Smart Grid  
 Future Generation Computer Systems  
 Czech Science Foundation  
 Journal of Ambient Intelligence and Humanized Computing  
 Vehicular Communications  
 The Journal of Supercomputing  
 IEEE Consumer Electronics Magazine  
 IEEE SMC Magazine  
 IEEE World Forum on Internet of Things  
 IEEE Access  
 Security and Communication Networks  
 Cybernetics and Systems

## PROFESSIONAL MEMBERSHIPS

IEEE Communications Society (ComSoc)  
 IEEE Information Theory Society  
 IEEE Computer Society Special Technical Community on Blockchain  
 IEEE Computer Society Technical Community on Cyber Security  
 IEEE Computer Society Technical Council on Software Engineering (TCSE)  
 ACM Graduate Student Member