

# ANIKET ANAND

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## EDUCATION

- **Indian Institute of Technology (BHU), Varanasi, India** (Jul 2016 - Jul 2020)  
B.Tech. in Ceramic Engineering  
CGPA: **9.34/10** (Ranked **4th** in Department)
- **Nalanda Academy Senior Secondary School, Kota, India** (Apr 2015 - Mar 2016)  
Secured **93.80%** in Class XII: Maths: 95%, Physics: 93%, Chemistry: 95%

## RESEARCH INTERESTS

Distributed Systems, IoT, Blockchain, System Security, Applied Cryptography, Applied Deep Learning

## INTERNATIONAL RESEARCH AND DEVELOPMENT EXPERIENCE

### A Novel Cryptocurrency Without Solving Consensus (Oct 2020 - Ongoing)

*Dr. Davide Frey, WIDE Group, INRIA Rennes, France*

- Formulating the design of a novel **cryptocurrency** based on scalable and reliable broadcast to ensure a simple FIFO order on balance and transfer operations in the presence of Byzantine processes

### Performance Evaluation of Intermittently Connected Blockchain Network (Feb 2020 - Ongoing)

*Prof. Muttukrishnan Rajarajan, SMCSE, City, University of London, England*

- Simulated Proof of Work blockchain instances with **wireless** and **mobile** nodes using **ns-3** simulator
- Analyzed **performance** of blockchain instances varying various **network** and **blockchain parameters** and performing **analytics analysis** to find the optimal instance in constrained network connectivity

### A Private Channel for ESP32 (Oct 2019 - Dec 2019)

*Prof. Massimo Villari, MIFT, University of Messina, Italy*

- Utilized **Net module** of **LuaRTOS** firmware for ESP32 to connect it to a Wifi WPA2 Enterprise “eduroam” network and established a secure connection with OpenVPN server using client certificates

### Blockchain-Based Architecture for Regional Air Traffic Flow Management (May 2019 - Jul 2019)

*Dr. Ta Nguyen Binh Duong, SCSE, Nanyang Technological University, Singapore*

- Established a **Hyperledger Fabric** network on lab servers representing airports and trained separate Q-Tables independently with **700+** Flightradar24 data of **ASEAN** countries for local optimization
- Optimized the Q-Tables locally using **epsilon-greedy** updates, recorded them on ledger transaction and voted for the global optimal model in **Chaincode** while preserving the **privacy** of airport flight data
- Achieved around **15%** reduction in system penalty (inversely proportional to ground and in-air delay) and the delays converged **33%** faster when executed for 1000 local training iterations with 10 votings

### Privacy-Preserving in Decentralised Supply Chain Management (DSCM) Tool (Dec 2018 - Apr 2019)

*Prof. Ali Sunyaev, AIFB, Karlsruhe Institute of Technology, Germany*

- Enhanced the functionalities of an access-management Desktop Application programmed in Java 8 installed on **Ethereum Geth** client connected to **Rinkeby** testnet to grant/revoke access to supplier-data
- Implemented smart contract's request for JSON Web Token (JWT) in **Solidity** and integrated an Admin view in the DSCM tool to **synchronize** particular permissions with the deployed smart contract

### Advanced Techniques for Osmotic Computing (Jun 2018 - Nov 2018)

*Prof. Massimo Villari, MITF, University of Messina, Italy*

- Generated **RSA** public-private key pair and Certificate Signing Request (CSR) in **ESP32** (acting as data producer) for its authentication and processed sensor data to JWS Compact Serialization for encryption
- Configured instances of a **Certificate Authority** in **Docker** container by **OpenSSL** for signature and in smartphone (consumer) for verification of securely transmitted **X.509** Public Key Certificates

## PUBLICATIONS

- **A. Anand, A. Galletta, A. Celesti, M. Fazio and M. Villari, "A secure inter-domain communication for IoT devices," 2019 IEEE International Conference on Cloud Engineering (IC2E), Prague, Czech Republic, 2019, pp. 235-240. DOI: [10.1109/IC2E.2019.00038](https://doi.org/10.1109/IC2E.2019.00038)**

- S. Gupta, R. S. Singh and A. Anand, "Cloudlet Scheduling using Merged CSO algorithm," 2018 Fifth International Conference on Parallel, Distributed and Grid Computing (PDGC), Solan Himachal Pradesh, India, 2018, pp. 278-283. DOI: [10.1109/PDGC.2018.8745975](https://doi.org/10.1109/PDGC.2018.8745975)

## KEY PROJECTS AND INTERNSHIPS

### Spaced Repetition in Deep Knowledge Tracing (DKT) (Sep 2019 - Nov 2019)

*Prof. A K Singh, Computer Science and Engineering, IIT (BHU)*

- Implemented the training process of LSTM-based Seq2Seq DKT model in TensorFlow after processing the attributes of **13 million** inputs of Duolingo student **language learning data** to one-hot encodings
- Obtained **77%** area under curve, **71%** accuracy, **73%** precision, and **82%** recall rate of correct answers on executing the DKT model for 5 epochs on 100,000 cross-validation set of language learning data

### An Efficient Algorithm for Cloudlet Scheduling (Feb 2018 - May 2018)

*Prof. Ravi Shankar Singh, Computer Science and Engineering, IIT (BHU)*

- Contrived a mapping of processors to tasks by systematically combining the advantages of Particle Swarm and Cat Swarm Optimization algorithms and simulated the allocation on **CloudSim** simulator
- Achieved **20%** reduction in execution time without an increase in cost and a lowered randomness error

### PHP Webapp Development (Dec 2017 - Jan 2018)

*Geniesoftsystem Pvt. Ltd, Mumbai, India*

- Developed an **e-commerce** webapp in PHP's Codeigniter framework using MySQL database managed by phpMyAdmin for users to register, login and add, remove, and edit their product to be sold

### Android Application Development at Geniesoftsystem Pvt. Ltd. (May 2017 - Jul 2017)

*Geniesoftsystem Pvt. Ltd, Mumbai, India*

- Developed an application to **generate** QR code of input text and separately **scan** any given QR code. Available on **Google Play Store** for Android version 4.0.3 and above <http://bit.ly/330Mj8N>
- Implemented logic of multiplayer **Teen Patti** (a card game) by leveraging **AsyncTask** threading class for sequential execution players' moves and developed client's requirement-compliant UI for Android app

## RELEVANT COURSES UNDERTAKEN

- **Computer Science:** Computer Programming, Network Security, Natural Language Processing, [Introduction to Modern Application Development](#)<sup>\*</sup>, Operating System<sup>\*</sup>, [Deep Learning Specialization](#)<sup>+</sup>, [Applied Cryptography](#)<sup>+</sup>, [Algorithms on Graphs](#)<sup>+</sup>, [Python for Everybody](#)<sup>+</sup>
- **Mathematics:** Engineering Mathematics I, Engineering Mathematics II, Mathematical Methods, Operation Research, Discrete Mathematics<sup>\*</sup>, [Probability and Computing](#)<sup>#</sup>

## TECHNICAL SKILLS

- **Languages:** C, C++, Python, Java, Golang, Solidity
- **Technologies Used:** ns-3, Arduino, Amazon EC2, Docker, OpenVPN, Hyperledger Fabric, TensorFlow

## SCHOLASTIC ACHIEVEMENTS AND ACCOLADES

- Nominated for **Sahaj Memorial Award** of AIPMA for best student in Ceramic Engineering (2020)
- Selected among **35 students** from India for **NTU-India Connect Research Internship** (2019)
- Invited by **Hasura** for onsite **Product Development Fellowship** (2017)
- Secured **All India Rank** within top **4%** in JEE-Advanced out of 200,000+ aspirants (2016)
- Achieved **All India Rank** within top **0.8%** in JEE-Main out of 1.2 million+ aspirants (2016)
- Secured a **top 300** spot in National Standard Examination in Junior Science (NSEJS) (2013)

## EXTRACURRICULARS

- Contributing to **CNCF Layer5** open source project (2020)
- Built an **Alexa skill** during Training Alexa workshop organized by **Amazon Web Services** (2019)
- Developed **Photo Censor app** for nudity detection in **Microsoft Code Fun Do Hackathon** (2018)
- Assisted in the Appathon (hackathon event) of **Technex'18** as an Event Coordinator (2018)
- Co-organized frequent **Android Development Workshops** for Freshers of IIT (BHU) (2017)