SHAILESH MISHRA

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Areas Of Interest

Blockchain, Decentralised Systems, Networks, Security, Smart Contracts, Privacy, Internet of Things, Cryptography

Education

Indian Institute of Technology, Kharagpur *2017 - 2022*
B.Tech + M.Tech in Electrical Engineering CGPA: 8.89/10
Minor in Computer Science and Engineering

Shiv Jyoti Secondary School, Kota *2015 - 2017*
All India Senior School Certificate Examination (AISSCE), 2017 Overall Percentage: 96.8

Belpahar English Medium School, Belpahar *2005 - 2015*
Indian Certificate of Secondary Education (ICSE), 2015 Overall Percentage: 97.2

Publications

Smart Voltage Monitoring: Centralised and Blockchain-based Decentralised Approach
Shailesh Mishra, Shivam Kumar
Accepted at *2020 IEEE International Conference on Internet of Things & Intelligence System*

BlockTorrent: A privacy-preserving data availability protocol for multiple stakeholder scenarios
Ambrose Hill, Shailesh Mishra, Ali Dorri, Volkan Dedeoglu, Raja Jurdak, Salil S. Kanhere
Accepted at *IEEE International Conference on Blockchain and Cryptocurrency 2021 (ICBC 2021)*

iContractBot: A chatbot for Smart Contracts' Specification and Code Generation
Ilham Qasse, Shailesh Mishra, Mohammad Hamdaqa
Accepted at *3rd International Workshop on Bots in Software Engineering*

Near-Immediate Consistency with Tree-chain's Fast Consensus
Ali Dorri, Shailesh Mishra, Raja Jurdak
Submitted to *Elsevier's Computer Networks Journal*

Towards Conversational Concrete Syntax for Model Specification and Code Generation : The Case of Smart Contracts Development
Ilham Qasse, Shailesh Mishra*, Mohammad Hamdaqa*
Submitted to *37th International Conference on Software Maintenance and Evolution*

Research Experience

Integration of Blockchain and IoT *Jan 2020 - Present*
Remote Research Intern Queensland University of Technology
Supervised by **Prof. Raja Jurdak**

- BlockTorrent: A privacy-preserving data availability protocol for multiple stakeholder scenarios
  - Developed an overlay network for off-chain communications in a system incorporating Blockchain & BitTorrent
  - Analysed the effect of file size and number of chunks on file splitting, distribution and regeneration based on BitTorrent algorithms to obtain important design choices for optimal network design
- Vericom: A Verification and Communication Architecture for IoT-based Blockchain
  - Submitted to **International Conference on Internet of Things Design and Implementation (IoTDI)**
  - Implemented a packet-optimised blockchain framework for improving performance of IoT-based blockchain
  - Studied the packet overhead, network and processing delay to compare with the existing blockchain arhitecture
- Near-Immediate Consistency with Treechain's Fast Consensus
  - Worked on the implementation of an efficient consensus algorithm on a network to reduce the delay and overhead during transactions in IoT scenario
  - Developed the smart contract which is responsible for consensus code range allocation and ledger formation

Smart Contract Generation from Natural Language *Feb 2020 - May 2021*
Remote Research Intern Repository Reykjavik University
Supervised by **Prof. Mohammad Hamdaqa**

- Built a beta version chatbot using Xtext and Xatkit to generate smart contract code for multiple platforms
- Integrated DialogFlow intent detection and Levenstein within the chatbot to improve the robustness of the chatbot
- Conducted a user survey to understand user experience and expectation for the evaluation and analysis of the chatbot

Deca-ARCADE, A Decentralised Marketplace *May 2019 - Jul 2019*
Summer Research Fellow IIT Hyderabad
Supervised by **Prof. Uday B. Desai** and **Prof. Sathya Peri** Report

- Developed an end-to-end multi-featured decentralised marketplace using Ethereum, IPFS and ReactJS
- Established an efficient distributed data sharing framework that could help both sellers and buyers

Smart Voltage Monitoring *Oct 2019 - Jun 2020*
Summer Research Project IIT Kharagpur

- Built a centralised model for storing and analysing voltage data using client-server architecture
- Proposed and implemented a decentralised model for storing and analysing voltage data using Ethereum and IPFS
- Studied both the models to evaluate the time taken to distribute and analyse voltage data; examined the effect of improving security in the decentralised model

Research Projects

Protected Phase Measurement Unit(PMU) System *Jul 2020 - Nov 2020*
Term Project IIT Kharagpur
Supervised by **Prof. Ashok K. Pradhan**

- Implemented different encryption schemes on voltage data obtained from 9-bus load flow simulation
- Developed on different network topology to obtain the optimal design for data transfer on a phasor network

Study of privacy hazards of public reviews on E-Commerce platforms *Aug 2020 - Dec 2020*
Term Project IIT Kharagpur
Supervised by **Prof. Mainack Mondal**

- Scraped 32.16k user reviews & public profiles from Amazon for quantitative & qualitative analysis
- Executed Named Entity Recognition and RegEx matching to obtain the first set of sensitive information in reviews
- Worked on qualitative analysis of reviews to understand the context of reviews of revealing sensitive information

Voltage Monitoring System *Dec 2018 - Mar 2019*
Semester Project Repository IIT Kharagpur
Supervised by **Prof. Ashok K. Pradhan**

- Constructed a handy and accurate hardware device using Arduino to obtain voltage values
- Developed an efficient client-server application to transfer voltage data from clients to server
- Designed an efficient method to package & extract data & applied DFT to improve the voltage measurement procedure

Programmable and Embedded Systems *September 2020 - November 2020*
Semester Project IIT Kharagpur
Supervised by **Prof. A. Routray**

- Noise filtering of EEG data on STM Repository
  - Implemented Notch Filter and Particle Swarm Optimization on MATLAB to obtain the filter coefficients
  - Filtered the EEG data using Assembly Language on STM using the coefficients obtained from MATLAB
- Mobile Application for Activity Detection Repository
  - Implemented Kalman Filter on Android Studio(Java) for noise reduction of real-time acceleration sensor data
  - Integrated Jenson Shannon divergence for classifying estimated data to walking, standing and climbing stairs

DyslexHelp: An application to help kids with dyslexia *Jan 2020 - Jun 2020*
Term Project Repository IIT Kharagpur

- Built a web-application using flask to enhance the learning of kids with dyslexia
- Incorporated tests for improving both listening and reading ability of kids with dyslexia; Integrated a teacher module so that new words can be added by teachers for enhancing learning; included a tutorial module for learning new words

Competitions

HelpMate: A helmet meant for all-round protection of a driver Report *Aug 2019 - Apr 2020*
Product Design IIT Kharagpur

- Fashioned a compact helmet which enhanced overall safety of a person riding on a two-wheeler vehicle
- Secured **1st Position** among 17 teams in Open-IIT Product Design Competition

DisHA: An aid for people stuck in disasters Report *Oct 2018 - Mar 2019*
Product Design IIT Kharagpur

- Designed a cost-effective product to locate distressed people during disasters using RF waves

Litigator: A law based search engine Report *Mar 2019 - Apr 2019*
Software Development IIT Kharagpur

- Built a efficient law-based search engine in the Indian domain for both law-experts and common people
- Secured **1st Position** among 12 teams in Inter-Hall Open Soft Competition

ALCOLOC: A product for making driving safe Report *Aug 2018 - Sep 2018*
Product Design IIT Kharagpur

- Designed a product to prevent accidents due to drink-and-drive cases by using blood alcohol content

MEDI-BIN: A product for safe disposal of biomedical waste Report *Oct 2017 - Mar 2018*
Product Design IIT Kharagpur

- Designed a compact product to decompose biomedical waste using plasma pyrolysis technology

Technical Skills

Software	Truffle, Ganache, IPFS, web3js, NS3, MS Office, AndroidStudio, MATLAB, LaTeX, SNAP, Rasa, DialogFlow, Xatkit, Xtext, Xtend
Libraries	Flask, Pandas, Socket, Scrapy, Matplotlib
Languages	C, C++, Java, Python, HTML, CSS, JavaScript, Solidity, ReactJS, Arduino, Assembly Language

Relevant Coursework

Completed Courses	Programming & Data Structures, Signals & Networks, Transform Calculus, Analog Electronics, Measurements & Electronic Instruments, Social Computing, Power System, Smartphone Computing & Analysis, Probability & Stochastic Processes, Embedded Systems, Computer Architecture & Operating System, Audio Systems & Engineering, Usable Security & Privacy, Digital Signal Processing, Analog Signal Processing, Programmable & Embedded System, Security Aware CPS & IoT Design, Statistical Signal Processing, Advanced Sensing Techniques

Awards and Achievements

JEE 2017	Ranked among the top 0.1% of the students in India in Joint Entrance Examination - 2017.
KVPY Scholar	Selected for the prestigious KVPY fellowship offered by IISc, in the year 2016-17
SRFP Recipient	Selected for the prestigious Summer Research Fellowship Programme(SRFP) conducted by the Indian Academy of Sciences in the year 2018-19

Extra-curricular Activities

- A regular tennis player & participated in the **Inter-IIT Tennis Camp 2019** as well as an **Inter-IIT Probable**; lead a team of 5 players as the **Captain** of RK Hall Tennis Team
- Tutored over **100 first-year undergraduate students** in Programming and Data Structures Doubt Sessions
- Guided over **70 undergraduate students** as **Vice-Captain** of RK Hall Product Design & OpenSoft Team
- Mentored **4 first-year UG students** of Electrical Engineering Dept. under the Student Mentorship Program