

Pappu Kumar (Ph.D CSE, IIT Madras)

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Education

Indian Institute of Technology (IIT), Madras <i>Ph.D in Computer Science with CGPA: 7.75/10, Guide: Dr. John Augustine.</i>	<i>Sept 2020 – Till Date</i>
University of Zurich, Switzerland <i>UZH Summer Schools on Deep Dive into Blockchain, Credits: 7 ECTS.</i>	<i>July 2022 – July 2022</i>
National Institute of Technology (NIT), Jaipur <i>M.Tech in Computer Science with CGPA: 7.60/10.</i>	<i>Aug 2018 – June 2020</i>
University of Delhi (DU), Delhi <i>B.Tech in Computer Science with CGPA: 7.26/10.</i>	<i>Aug 2014 – June 2018</i>

Research Interests

Distributed System, Peer to Peer System, Blockchain, Distributed Ledger Technology, Byzantine Agreement, Consensus Algorithms.

Experience

Project Manager <i>CAMS IITM Fintech Innovation Lab</i>	<i>Chennai, India</i> <i>July 2023 – June 2024</i>
<ul style="list-style-type: none">◦ Designed and proposed a blockchain-based solution to address the challenges faced by Indians in completing individual Know Your Customer (KYC) processes for multiple financial institutions.◦ Achieved 2000 TPS for reads and 1000 TPS for writes during testing on Machine with 16GB RAM and 7 servers participating in blockchain consensus.◦ Implemented the proposed architecture and demonstrated a proof of concept (PoC) for the implementation.◦ Technologies used: Tendermint, Node.js, React.js, MySQL, and Docker.	
Research Scholar <i>Ph.D @CyStar Lab, IIT Madras</i>	<i>Chennai, India</i> <i>Sept 2020 – Till Date</i>
<ul style="list-style-type: none">◦ Working in Distributed Computing, with a focus on P2P systems like Blockchain, and researching designs for population-scale blockchains with high throughput and low energy consumption consumption to address India's Blockchain needs.◦ Exploring applications of blockchains in the Indian context, such as managing land records with smart contracts and using NFTs for managing intellectual property rights efficiently.	

Projects

Created My Own Blockchain From Scratch	<i>May 2023 - Dec 2023</i>
<ul style="list-style-type: none">◦ Designed and developed a custom blockchain from scratch and Implemented core features such as block creation, validation, and consensus mechanism.◦ Built transaction verification and block synchronization protocols and Integrated cryptographic functions for secure data handling.◦ Technologies used: JavaScript, NodeJS, VMWare, Docker and Pre-build Libraries.	
Wrote a Framework to Simulate Distributed Algorithms	<i>May 2022 - May 2023</i>
<ul style="list-style-type: none">◦ Designed and developed a framework to simulate message-passing distributed algorithms and test their correctness.◦ Enables performance comparison and real-time observation of distributed algorithms.◦ Technologies used: JavaScript, NodeJS, VMWare, Docker and Pre-build Libraries.	
Comparative Analysis of Image Dehazing Techniques <i>Master Dissertation, NIT Jaipur</i>	<i>June 2019 – May 2020</i>

- Conducted a study on the problem of image hazing and Performed a comparative analysis of various image dehazing techniques through practical implementation.
- Technologies used: OpenCV, Image Processing Tools.

MySQL Compiler Design From Scratch

May 2017 - Dec 2017

- Developed SQL compilers for SELECT, INSERT, and DELETE commands as part of a DBMS class project, optimizing database query processing.
- Technologies used: Lex, YACC, C, C++.

Delhi University Innovation Project

May 2016 - May 2017

- **Title: *Weaving Dreams for Destitutes*** – Addressed issues and proposed solutions for night shelters. Project funded by the Delhi University Innovation Program.
- Collaborated with IIT Bombay and the Design Innovation Centre at Delhi University to design a Proof of Concept (PoC).

Teaching Experience

Courses Taught at IIT Madras & Role:

- CS3500: Operating Systems (*as Lead TA*), in Fall 2024.
- CS6858: Distributed Trust (*as Lead TA*), in Autumn 2023 & Autumn 2024.
- CS2200: Languages, Machines and Computation (*as Lead TA*), in Fall 2023.
- CS5691: Pattern Recognition and Machine Learning (*as Lead TA*), in Fall 2021.
- CS1100: Introduction to Programming as a Teaching Assistance (*TA*), in Autumn 2020.

Workshop Conducted:

- Conducted a course on “[Blockchains: Fundamentals and Applications](#)” [🔗](#) in collaboration with IIT Madras Pravartak, covering distributed algorithms, Byzantine agreement protocols, blockchain platforms (Bitcoin, Ethereum, Hedera), and smart contract development using Ethereum and Hedera.
- Invited as a lecturer for a workshop on Blockchain and Smart Contracts at SSN College of Engineering, Chennai; delivered sessions on writing smart contracts and NFTs using Solidity and Ethereum.
- Invited as a lecturer for a Blockchain and Smart Contracts workshop at Shiv Nadar University, Chennai; delivered a session on writing smart contracts and building NFTs using Solidity and Ethereum.

Technical & Personal Skills

- **Platforms:** Windows, Linux (Kali, Ubuntu), Mac OS.
- **Programming Languages:** C, C++, Python, Java, JavaScript, SQL, PHP, MATLAB.
- **Framework:** Node JS, React JS.
- **Databases:** MySQL, MongoDB.
- **Networking Tools:** Nmap, WireShark, VMWare, Docker
- **Hobbies:** Jogging, Cycling, Yoga, Meditation, Reading Self Help and Traveling.

Certifications & Awards

- Qualified the prestigious Graduate Aptitude Test in Engineering (**GATE**) in **2018, 2019, and 2020**.
- Completed the following courses on **Udemy.com**: **[1.]** Complete Python Boot-camp, **[2.]** Effective Time Management, and **[3.]** Build Your Own Blockchain with JavaScript.
- Attended the 7th Technical & Science Writing Workshop organized by IIT Madras in collaboration with Kenyon College, Gambier, Ohio, USA (May 15-19, 2023).
- Attended the Fine-grained Cryptography workshop at FSTTCS 2022, organized by IIT Madras.