

# Arnab Mukherjee

📍 Kolkata, India   ✉️ [arnabm1099@gmail.com](mailto:arnabm1099@gmail.com)   ☎️ +91 8240326366   📄 [mukherjeeearnab.github.io](https://mukherjeeearnab.github.io)

## EDUCATION

<b>Bachelor of Technology - Computer Science &amp; Engineering (GPA 8.8/10)</b> <i>Maulana Abul Kalam Azad University of Technology</i>	Jul 2018 – Jun 2022 Kolkata, India
<b>Higher Secondary Education (82.6%)</b> <i>Kendriya Vidyalaya Ballygunge</i>	May 2015 – Mar 2018 Kolkata, India
<b>Secondary Education (CGPA 9.2)</b> <i>Kendriya Vidyalaya Ballygunge</i>	Apr 2013 – Mar 2015 Kolkata, India






## SKILLS

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|----------------|--------------|-----------|--------------|
| • HTML5 / CSS3 | • JavaScript | • Node.JS | • React JS   |
| • Python       | • Solidity   | • MongoDB | • PostgreSQL |

## PROFESSIONAL EXPERIENCE

<b>Research Intern</b> <i>Indian Institute of Technology Patna</i>	May 2020 – Dec 2021 Patna, India
<ul style="list-style-type: none"><li>• Researched the applications of blockchain technology in various industry sectors.</li><li>• Tested the application of machine learning to detect vulnerabilities in smart contracts.</li><li>• Implemented a federated learning architecture for Deep Q Learning agents.</li><li>• Designed and developed three smart city platforms based on Hyperledger Fabric and Ethereum.</li><li>• Implemented REST APIs using Express and Node.js.</li><li>• Drafted frontends for the projects using React JS.</li></ul>	
<b>Full-Stack Web Development Intern</b> <i>Insolva Solutions Inc.</i>	Jan 2020 – Apr 2020 Kolkata, India
<ul style="list-style-type: none"><li>• Designed and Developed a company website for an NGO using the LAMP stack.</li><li>• Implemented a blogging website, similar to WordPress for a client using the MERN stack.</li></ul>	

## PROJECTS

<b>Template Portfolio Website for Researchers</b>  <a href="https://github.com/mukherjeeearnab/researcher-portfolio">github.com/mukherjeeearnab/researcher-portfolio</a>
<ul style="list-style-type: none"><li>• Designed and implemented a template portfolio website on React JS, for Researchers or University Professors.</li><li>• Demo available at <a href="https://mukherjeeearnab.github.io/researcher-portfolio">https://mukherjeeearnab.github.io/researcher-portfolio</a> </li></ul>
<b>Distributed Deep Q Learning</b>  <a href="https://github.com/mukherjeeearnab/distributed-deep-qnet">github.com/mukherjeeearnab/distributed-deep-qnet</a>
<ul style="list-style-type: none"><li>• Implemented a distributed architecture for Deep Q Learning, based on Google's DownpourSGD.</li><li>• Implemented the project on Python, using PyTorch, Flask, OpenAI Gym, based on a client-server model.</li></ul>
<b>GoTPE</b>  <a href="https://github.com/mukherjeeearnab/gotpe">github.com/mukherjeeearnab/gotpe</a>
<ul style="list-style-type: none"><li>• Implemented a Go package for Threshold Predicate Encryption (TPE).</li><li>• TPE is a variant of functional encryption, based on the works of Khai Zhou et. al. in IEEE TIFS Vol.: 13.</li></ul>
<b>Vulnerability Detection of Solidity Smart Contracts</b>  <a href="https://github.com/mukherjeeearnab/soli-swc">github.com/mukherjeeearnab/soli-swc</a>
<ul style="list-style-type: none"><li>• Implemented a Deep Learning model to detect vulnerabilities in Solidity smart contracts.</li><li>• The LSTM model, implemented on Tensorflow, achieved an F-1 score of 97.85% during the tests.</li></ul>

## PUBLICATIONS

<b>SmartMixModel: Machine Learning-based Vulnerability Detection of Solidity Smart Contracts</b> <i>5th IEEE International Conference on Blockchain (Blockchain 2022), IEEE Press. (Submitted)</i> Supriya Shakya, Arnab Mukherjee, Raju Halder, Abyayananda Maiti, Amrita Chaturvedi.	2022
<b>A Blockchain-Based Integrated and Interconnected Hybrid Platform for Smart City Ecosystem</b> <i>Peer-to-Peer Networking and Applications (PPNA), Springer (Under Review)</i> Arnab Mukherjee, Swagatika Sahoo, Raju Halder.	2022

- Blockchain-Enabled Emergency Detection and Response in Mobile Healthcare System** May 2022  
*IEEE International Conference on Blockchain and Cryptocurrency (ICBC '22)*, IEEE Press. (Accepted)  
Suryakanta Panda, Arnab Mukherjee, Raju Halder, Samrat Mondal.
- A Unified Blockchain-based Platform for Global e-waste Management** 2021  
*International Journal of Web Information Systems (IJWIS)*, Volume 17(5): 449-479. Emerald Publishing.  
Swagatika Sahoo, Arnab Mukherjee, Raju Halder.
- An Integrated Platform for Vehicle-Related Services and Records Management using Blockchain Technology** Apr 2021  
*13th Asian Conference on Intelligent Information and Database Systems (ACIIDS '21)*, Springer CCIS 1371.  
Arnab Mukherjee, Raju Halder.
- PoliceChain: Blockchain-Based Smart Policing System for Smart Cities** Nov 2020  
*13th International Conference on Security of Information and Networks (SIN '20)*, ACM Press.  
Arnab Mukherjee, Raju Halder.

## INTERESTS

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- Playing the Guitar and Piano, and arranging scores for them.** (My arranged scores can be found on MuseScore @quinn1601)
- Landscape and Bird Photography** (My photography portfolio can be found my Instagram account @arnabm99)
- Repairing Computers and Electronics** (Along with computers and electronics, I also love fixing cars)