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Advanced Blockchain Technologies : A Comprehensive Textbook on Ethereum Smart Contracts to Decentralised Applications

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Description

It is a comprehensive guide designed to educate readers on Ethereum, a groundbreaking blockchain platform introduced through Vitalik Buterin's influential whitepaper. This sequel to the successful "Blockchain Technology: Algorithms and Applications" delves into Ethereum's innovative incorporation of programmability, which extends blockchain's capabilities beyond mere financial transactions to include Decentralised Applications (DApps).

The book meticulously covers foundational concepts, starting with Ethereum's evolution from Proof of Work to Proof of Stake, and includes exercises for readers to reinforce their understanding. It explores Ethereum's architecture, including the Ethereum Virtual Machine, Gas, ether (ETH), and transaction lifecycle, while emphasising smart contracts and their unique applications. Essential tools for users and developers are detailed, alongside extensive coverage of Solidity, the programming language for smart contracts.

Later chapters guide readers through token standards, network interactions, and the process of building DApps. Advanced topics such as smart contract upgrades, DAO, oracles, and Ethereum's major updates are also discussed. This book is crafted to be a reliable reference, keeping pace with technological advancements, and is poised to be embraced by readers with enthusiasm.

About the Author

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Dr. Asharaf S. is a distinguished computer scientist with extensive expertise in AI-related algorithms. He received his Ph.D. and Master of Engineering degrees in Computer Science from the Indian Institute of Science, Bangalore. Post-Ph.D., he worked as a Research Scientist at America Online (AOL) R&D Labs and later served as a faculty member at the Indian Institute of Management Kozhikode (IIMK). Currently, he is the Dean (Academics) and Professor at Digital University Kerala, while also serving as a visiting faculty for MDP programs at IIMK.

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Sivadas Neelima is a Research and Development Engineer at Kerala Blockchain Academy (KBA), a Centre of Excellence of Digital University Kerala. She holds a Master’s degree in Biomedical Engineering and Post Graduate Diploma in Intellectual Property, Rights, and Law. She began her journey at KBA as an intern through the prestigious Blockchain Excellency Programme. Her key contributions include writing blog articles on blockchain, serving as a content reviewer for the renowned Ethereum Developer Program, and hosting podcasts. She is also a DLT Talent graduate, having completed an 18-week mentored program from the Frankfurt School of Blockchain Center. Before joining KBA, she worked as a Junior Research Fellow for a DST (Department of Science and Technology, India) project and later as a Project Manager for the British Council project. Her diverse interests span blockchain, project management, intellectual

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Sumi Maria Abraham is a Research and Development Engineer at Kerala Blockchain Academy (KBA), a Centre of Excellence of Digital University Kerala. She holds an M.Tech in Computer Science and has contributed a key role in content development for KBA's Ethereum Developer Program and the Certified Ethereum Network Administrator Course. She has authored several blockchain articles for KBA's social media channels. Before Joining KBA, she worked as an Assistant Professor at Lourdes Matha College of Science and Technology, affiliated with APJ Abdul Kalam Technological University, Thiruvananthapuram, Kerala, and as a Software Developer at UST. Her areas of interest include blockchain technology, Ethereum, Data Structures, and the Theory of Computation.

Dr. Adarsh S is a Postdoctoral Researcher at the School of Business, National University of Ireland, Maynooth. He previously served as a Senior Scientist and Convener of Kerala Blockchain Academy. He earned his Ph.D. from Cochin University of Science and Technology and was part of the Agrochain team, which won the Profer International Blockchain Hackathon (2017) and received the NITI Aayog prize for Golden Ticket Entry to the Global Entrepreneurship Summit (2017). Dr. Adarsh is also a technical representative of the Hyperledger Foundation and a recipient of the Junior Research Fellowship in Engineering Sciences (2014) from the Kerala State Council for Science, Technology & Environment (KSCSTE). Before pursuing his Ph.D, he worked as an Assistant Professor at Sree Buddha College of Engineering under Kerala University. His interests include blockchain and smart contracts, machine learning, and bio-inspired computing.

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