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Editorial

Dear Reader,

Throughout the history, exchange of trusted information among people played an essential role in every aspect of their lives: socially, economically and politically. Blockchain is an innovation in database technology for keeping temper proof (trusted) data in a permanent, immutable, decentralized, global, and trustless ledger. It opens up new ways how the data is recorded in a database. It is a relatively new, but fast growing field that combines distributed computing, databases, networks and cryptography and is rapidly evolving. It allows people, organizations and machines to digitize their current relationships as well as forming new secure digital ones since data is disclosed, secured and recorded differently in a blockchain database system. Moreover, a paradigm shift is taking place where individuals, organizations and machines are being empowered in a strong system of digital identity in managing their data and their interactions. At the same time, seamless and prompt inter-organizational data flow and data sharing are reshaping the organizations and their collaborations, both public and private, from supply chains to finance, as well as in other domains. There are permissionless blockchains for creating decentralized autonomous organizations, such as cryptocurrencies or permissioned blockchains that are used in data integration in interorganizational collaborations.

We are living in interesting times. First time in history issuing money by private citizens is a possibility now. Also the blockchain technology has the potential to disrupt every industry and transform current organizations and give way to new forms of organizations.

We have five interesting articles in AiTEC's this special issue on "Next Generation Blockchain Architecture, Infrastructure and Applications". We have enjoyed preparing it and hope you will enjoy reading it. The first one is, 'Dining Philosophers, Byzantine Generals, and the Various Nodes, Users, and Citizens under Blockchain' by Denisa Reshef Kera examines philosophical origins of the blockchain concepts. It is not only an articulate examination of Algorithmic Governance, blockchain protocols, and consensus mechanisms that renders the political process to machines and transfer deliberation and negotiation to algorithms, but is thought provocating, and entertaining as well. It proposes the creation of policy sandboxes and "testnets" for experiments that involve the relevant stakeholders for identifying possible solutions. The second article 'A survey on efficient parallelization of blockchain-based smart contracts' by Alessio Meneghetti, at. al examines the time and computational power required to reach consensus in smart contract platforms. They survey some of the state-of-the-art approaches to obtain an efficient and scalable computation of smart contracts with an emphasis in sharding that is a promising method which allows parallelization and efficient resource utilization.

The third article 'Blockchain Technology in IoT Systems: Review of the Challenges' by Yeray Mezquita, et .al. examines the principal challenges blockchain based IoT systems are currently facing such as scalability, storage requirements and corrupted data because of compromised security.

The fourth article 'Two-tier Blockchain Timestamped Notarization with Incremental Security' by Alessio Meneghetti, at. al. designes a two-tiered system of independent blockchains for secure timestamping that provides incremental levels of evidence and examines the assumptions for the system to be secure. The two-tiered system is designed to reduce the cost and increase efficiency of commitments unlike the slow and costly public blockchains.

The fifth article 'Privacy Laws in the Blockchain Environment' by Rocio de la Cruz notes the friction between Blockchain and the European General Data Protection Regulation ("GDPR") Requirements. GDPR has incorporated the strongest obligations and enforcement in privacy of personal data and its use. De la Cruz provides an overview of the main obligations, relevant areas of tension and set out an opinion on the best practices for Blockchain networks.

With best wishes.

Professor Abdullah Tansel (Special Issue Editor), On behalf of the Editorial Board, Annals of Emerging Technologies in Computing (AETiC).