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PhD Blockchain Technology

Are Blockchains the Means By Which We Can Collaborate at Scale?

Published Papers

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Socialism and the Blockchain

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Abstract

Bitcoin (BTC) is often cited as Libertarian. However, the technology underpinning Bitcoin, blockchain, has properties that make it ideally suited to Socialist paradigms. Current literature supports the Libertarian viewpoint by focusing on the ability of Bitcoin to bypass central authority and provide anonymity; rarely is there an examination of blockchain technology's capacity for decentralised transparency and auditability in support of a Socialist model. This paper conducts a review of the blockchain, Libertarianism, and Socialist philosophies. It then explores Socialist models of public ownership and looks at the unique cooperative properties of blockchain that make the technology ideal for supporting Socialist societies. In summary, this paper argues that blockchain technologies are not just a Libertarian tool, they also enhance Socialist forms of governance. View Full-Text

Keywords: Bitcoin; blockchain; cryptocurrency; fiat money; libertarianism; socialism; Marxism; anarchism

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Towards a post-cash society: An application to convert fiat money into a cryptocurrency

Steve Jonathan Huckle, Martin White, Rituparna Bhattacharya

Abstract

In this paper, we discuss an application that uses blockchain technology to transfer fiat money into a cryptocurrency — Ether. A typical use of this technology could be to become a component of a larger system, whereby, after traveling, a customer can exchange leftover foreign currency for their local denomination. However, a more interesting application could be to convert fiat money into a cryptocurrency to facilitate a *demonetisation* scheme, such as that implemented recently in India. In the latter context, we describe the development of our blockchain application against the ramifications of *demonetisation* and whether the Indian government could have augmented that scheme through technology such as ours. We discuss why the Indian government has not contemplated such a measure, which also leads to a discussion of whether they might have considered adopting their own cryptocurrency. However, even though the Indian public seems willing to adopt the technology, we find that unlikely. Finally, we show that our application demonstrates that fiat money to cryptocurrency conversion is technically feasible, but the Indian government is unlikely to consider such technology due to issues surrounding monetary sovereignty.

Keywords

Bitcoin; Ether; Ethereum; Blockchain; Cryptocurrency; Demonetisation; Fiat Money; Banknotes; Currency; Sovereignty; Monetary Sovereignty

Internet of Things, Blockchain and Shared Economy Applications ☆

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Abstract

This paper explores how the Internet of Things and blockchain technology can benefit shared economy applications. The focus of this research is understanding how blockchain can be exploited to create decentralised, shared economy applications that allow people to monetise, securely, their things to create more wealth. Shared economy applications such as Airbnb and Uber are well-known applications, but there are many other opportunities to share in the digital economy. With the recent interest in the Internet of Things and blockchain, the opportunity exists to create a myriad of sharing applications, e.g. peer-to-peer automatic payment mechanisms, foreign exchange platforms, digital rights management and cultural heritage to name but a few. While many types of shared economy scenarios are proliferating, few of them, so far, leverage the Internet of Things and blockchain as technologies to build distributed applications. This paper discusses how we might make use of the Internet of Things and blockchains to create secure shared economy distributed applications. Presented are examples of such distributed applications in the context of an Internet of Things architecture using blockchain technology.

Keywords

Internet of Things; blockchain; distributed applications; smart contracts; peer-to-peer; Radio Frequency Identification.

In Progress

Fake News - a Technolological Approach to Proving Provenance Using Blockchains and Distributed Filesystems

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Abstract

In this paper, we introduce a working prototype of an innovative technology for proving the origins of captured digital media. In an era of *fake news*, when someone shows us a video or picture of some event, how can we trust its authenticity? It seems the public no longer believe that traditional media is a reliable reference of fact, perhaps, in part, due to the onset of many diverse sources of conflicting information, via social media. Indeed, the issue of inaccuracy reached a crescendo during the 2016 US Presidential Election, when the winner claimed that a national newspaper was trying to discredit him by pushing disinformation. The newspaper itself had already accused a supporter of the winner of doctoring a photograph which claimed to prove vote rigging. The paper went to great lengths to prove the picture was fake, but wouldn't it be better if it were trivial to show that? The blockchain-based application introduced in this paper is a tool for proving authenticity. Therefore, it can help establish the validity of any source of digital media, such as a picture used in an attempt to add credibility to a news item. Put simply; by using the trust mechanisms of blockchain technology, we can show, beyond doubt, originality. However, while our technology will be able to verify the authenticity of media resources used within a story, we believe our application is only capable of providing a partial solution to *fake news*. Unfortunately, it is incapable of proving the authenticity of a news story as a whole. That takes human skills.

Keywords: Fake News, blockchain, Ethereum, IPFS, MetaMask, cryptography, public-key cryptography, digital signatures, PREMIS;