Symposium on Blockchain and Distributed Ledger Technologies for Spatial Information and Analysis

August 28, 2018, Co-located with GIScience 2018 in Melbourne, Australia

Description

Distributed ledger and blockchain technologies, the public, immutable and distributed database systems underlying cryptocurrencies, such as Bitcoin, along with the recent innovation to put decentralised programmable scripts (smart contracts) on blockchains, have generated a tremendous amount of interest lately. Many of the newly proposed applications of blockchain technology are geospatial in nature, including distributed land records, the internet of things, sensor networks, cloud computing, geo-privacy, and improved ownership models for crowdsourced geographic information. The representation of spatial information on the blockchain and the creation of smart contracts that are location-aware has the potential to impact geographic information systems to a similar degree as the introduction of Web 2.0 did over a decade ago.

Outline of Symposium

The symposium will begin with an introduction to the underlying technologies to enable beginners to contribute to the symposium as well. This followed by brief statements of interest from participants (for which we will collect one-pagers beforehand). The overall goal of the symposium will be to create a joint poster/mission statement showcasing how GIScience can benefit from these new technologies and the underlying paradigms and the other way around. Depending on the topics arising in the discussions and the statements of interest received beforehand, we will include breakout sessions or panels. Participants will also be invited to submit research papers on the topic to a special feature in JOSIS.

Call for statements of interest

For the symposium, we ask each participant to submit a short (1-2 page) statement of interest exploring ideas at the intersection of blockchains, distributed ledgers, smart contracts and spatial information research. Please email these to benjamin.adams@canterbury.ac.nz by **1 July**. Topics of interest include, but are not limited to:

- Representing spatial information on the blockchain, including 3D and complex geometries
- Indexing spatial information on the blockchain
- Handling geographic information uncertainty in smart contracts triggered by geospatial events
- Big geo-data on the blockchain including integration with other distributed decentralised database systems (e.g., IPFS)
- Distributed, peer-to-peer spatial data infrastructure
- Location-aware smart contracts
- Location verification for smart contracts
- Semantic sensor networks and event detection for smart contracts
- Producer ownership of volunteered geographic information
- Peer-to-peer geospatial data and public participation GIS

- Legal and social implications of spatial smart contracts and immutable spatial data on public blockchains
- Trust, reputation, and distributed consensus for geospatial information
- Geospatial metadata and geo-privacy issues for data on distributed ledgers
- Spatial applications of distributed ledger technology: for augmented reality, the internet of things, cloud computing, autonomous mobile systems, land ownership registry, environmental resource management, etc.
- Spatial analysis of public blockchain networks and users

Intended audience: Novice or advanced. As this is an emergent topic, we will provide background material and worked examples to illustrate the role that these technologies can play within GIScience.

Organizers: Krzysztof Janowicz and Blake Regalia, University of California, Santa Barbara, USA; Ben Adams, University of Canterbury, New Zealand