

Welcome to UNC-CH and the Symposium on Blockchain and Trusted Repositories. I am GM, Dean of the SILS and it is my pleasure to co-host today's events with the Knowledge Trust, the Center for Media Law & Policy, and the Kenan Institute of Private Enterprise. The Knowledge Trust is a community of people dedicated to open access to humanity's accrued knowledge and to enabling trustworthy flows of new knowledge. With this symposium we will initiate a service that helps people determine the provenance of data and information assets, which in turn allows them to make judgements about their authenticity and primacy. We hope that a consortium of individuals and organizations will join us in the months ahead.

This symposium addresses three key concepts that resonate across the divides between scholarly and pop culture and between technological progress and social policy. These concepts are blockchain, repository, and trust.

Blockchain is a strategy for managing a distributed ledger of transactions. At the top of the hype cycle on blockchain is the notion that blockchain will do for transactions what the Internet did for communications—drive the cost down dramatically. Proponents argue that a secure and distributed record of agreements, events, and proclamations will make paper record enterprises obsolete. Skeptics argue that it is a flash in the pan scheme by hackers and criminals to scam individuals and institutions.

<https://www.youtube.com/watch?v=xCHabOdNnj4>. Most of the oxygen in the space is taken up by applications of blockchain to cryptocurrencies, however there are countless other applications under discussion and development. Major banks, insurance companies, and title companies are looking at BC to replace physical buildings and paper with the cloud and persistent bits; others see BC to manage carbon credits <https://www.computerworld.com/article/3277207/blockchain-now-blockchain-can-turn-carbon-credits-into-tokens-for-trading.html>; and the transactions in data exchanges (Nov 2018 CACM, 50-51). The UNC Knowledge Trust is investigating ways that BC can be used to establish primacy and authenticity of repositories of humankind's collective knowledge as well as our personal digital creations ranging from photographs to health records. We are optimistic skeptics about BC and look forward to pushing the envelope of the technical and policy issues around BC.

The second concept is repository. We generally think of repositories as a cache or store with finding tools meant to securely keep something precious. Archives or libraries of documents have long been considered repositories and large investments are made along the entire range of the information life cycle. However, the concept has expanded in the digital age to include discrete media such as text, audio, and video and increasingly continuous or ephemeral streams of data. Repositories of human knowledge such as national libraries or archives are expected to preserve and make available the world's output of creativity and innovation, however, we are in a new digital realm today where volume and variety can overwhelm storage systems and where bits can be lost, altered, or restricted. Distributed repository strategies using technology like iRODS policy-based distribution or LOCKSS allocations across

the Internet have arisen to address some of these challenges, and blockchain is under study as another distribution strategy.

The third concept is trust.

Trust is a fragile condition that people adopt toward other people, institutions, and knowledge. In pre-electronic times, newspapers, books, and articles took time to edit, produce, and distribute. There was an inherent drag on the production of new knowledge and a governor on how knowledge artifacts came into repositories. Today 'publication' is instantaneous as personal observations or videos are immediately shared globally and even scholarly work cycles are strongly accelerated. Trust takes time and evidence to develop and can be broken by overt attacks or restricting information and in the Internet age by flooding the environment with conflicting information. Last week, the editor of *Science* wrote "We are now living in a world where the reality of facts and the importance of scientific inquiry and responsible journalism are questioned with distressing frequency" (Jeremy Berg, Oct 26 2018 vol 362(6413), p. 379, *Imagine a world without facts*). A survey out this week from the Baker Center at Georgetown reports that respondents have confidence in Amazon and Google at levels that rival the military, universities, and local police. Trusting your neighbor who has a great garden to recommend which plants to include in your garden is quite different than a highly rated garden website. We are increasingly asking: How do technologies affect our trust? Can we create human-machine partnerships that build or protect trust? For example, I serve on an editorial board for a new journal that will eventually have algorithms on the editorial board. It is a mistake to say that we can guarantee trust—that is to create an UL verification for facts or knowledge bases. What we can do is to build services that document and openly share provenance for ideas, statements, digital artifacts, and knowledge so that people can make their own judgments.

The plan of the day is to begin with three keynote presentations that will address blockchain from different perspectives—technology, finance, and law. Jean Camp, Mark Yusko, David Thaw. After the keynotes we will have lunch and informal discussion. The afternoon will offer 3 concurrent mini-tutorials on different topics—blockchain technology, trusted repositories, and public records--you picked one to participate in when you registered. We hope those will be both informative and engage you in discussion. We will close the day with a distinguished panel that will consider the question of how much, if any, control or authority should be built into trustworthy repositories that use BC.