ARCHANGEL: Securing UK national archives with AI and blockchain

May 31 2019

Credit: CC0 Public Domain

The University of Surrey is using its state-of-the-art blockchain and artificial intelligence technologies to secure the digital government records of national archives across the globe—including the UK,

Australia and the United States of America.

In a paper to be presented at the CVPR conference in Los Angeles in June, Surrey's Centre for Vision, Speech and Signal Processing (CVSSP) explain how they have been working with the Open Data Institute and the National Archives in the UK to develop ARCHANGEL—a highly secure, decentralised computer vision and blockchain based system that will safeguard the long-term future of digital video archives.

Blockchain is the technology behind crypto-currencies like Bitcoin. The University of Surrey is exploring alternative non-financial uses of blockchain for the public good. ARCHANGEL's blockchain works as a database maintained by multiple archives; everyone can check and add records, but no one can change them. As no data can be modified, the integrity of the historical record remains intact.

ARCHANGEL is specifically built to identify incidences of accidental modifications or tampering with the digital public record, and it is backed up by a proof-of-authority blockchain system. The new system has been trialed in national government archives of the UK, Estonia, Norway, Australia and the US (NARA).

Professor John Collomosse, who leads the project at the University of Surrey, said, "Archives across the world are amassing vast volumes of digital content, and it is important that they can prove their provenance and integrity to the public in a secure and transparent way.

"By combining blockchain and artificial intelligence technologies, we have shown that it is possible to safeguard the integrity of archival data in the digital age. It essentially provides a digital fingerprint for archives, making it possible to verify their authenticity."

ARCHANGEL was recently recognised as a research highlight in 10

years of the UKRI Digital Economy programme, which funds the project via the Engineering and Physical Sciences Research Council (EPSRC). ARCHANGEL is part of the [Surrey blockchain testbed](#). The testbed includes more than £3.5 million of UKRI and EU funded projects in this emerging technology.

John Sheridan, digital director of the National Archives, said, "Exploring blockchain technology together with some of the world's leading archives, the ARCHANGEL project has shown, for real, how archives might combine forces to protect and assure vital digital evidence for the future. ARCHANGEL has been an outstanding partnership that has delivered ground breaking research into the practicalities of using [blockchain](#) to assure trust in large scale digital archives."

Jeni Tennison, CEO of the Open Data Institute, said, "It is becoming easier and easier to manipulate digital records, which makes it crucial for the institutions who take care of those records to be able to demonstrate their trustworthiness."

More information: Tu Bui et al. ARCHANGEL: Tamper-proofing Video Archives using Temporal Content Hashes on the Blockchain. arXiv:1904.12059v1 [cs.CV]: arxiv.org/abs/1904.12059

Provided by University of Surrey