

Department	School of Computing
Supervisors	Dr Zakwan Jaroucheh, Dr Naghmeh Moradpoor
Project Title	How Blockchain and NFT Technologies can Fight Counterfeiting and Forgery of Physical Goods and Digital Assets in the Metaverse

PROJECT DESCRIPTION

Building blocks for the so-called "Internet of Value" are provided by blockchain and distributed ledger technology (DLT), which allow for the recording of interactions and the transfer of "value," which can refer to any record of ownership of an asset, such as money, securities, or land titles, as well as ownership of specific information, such as identity, health information, or other personal data. Blockchain technology is becoming more widely recognised as a tool for enhancing data openness and traceability in intelligent societies and social systems in the age of the "twin technologies." We clearly observe a movement toward a decentralised paradigm in the social media space. The Web3 plan makes the assertion that by entirely decentralising the web, it can eliminate the intermediary role of Big Tech companies. With the use of this new Web paradigm, numerous social media networks can now incorporate metaverses, cryptocurrencies, and tokens. This opens up the possibility of rewarding users for their social actions as well as defining Non Fungible Tokens (NFTs), digital assets that represent real-world objects like art, music, game items, and other real-world objects. This leads to the development of Social Finance (SocialFi), a new type of decentralised finance that may be crucial to the circular economy.

Following the initial disruptive outbreak in the cryptocurrency space, the DLT provides the foundation for a number of fresh, creative applications that have the potential to transform how people socialise and interact in daily life. NFTs, Web3 and the metaverse enable the creation of scarce digital objects used to mint unique versions of luxury goods, artworks, intellectual properties etc. To make these DLT applications really pervasive, some technological pitfalls have still to be solved. We, at the School of Computing, Edinburgh Napier University, invite candidates from worldwide seeking to pursue research in Blockchain and NFT technologies to join us in investigating and to proposing solutions to overcome these pitfalls. You will engage in multidisciplinary research and benefit from exposure to a network of esteemed academics and different industry partners. Here are some themes (not limited to) for PhD opportunities: blockchain scalability, the privacy vs. the auditability, the definition of blockchain oracles, of the inter-ledger technologies, and, in general, layer-2 technologies. The School of Computing is ideally located at the beautiful and central Merchiston campus in Edinburgh. You will be supported by the dedicated supervision team, formal challenging and interesting research training classes, world-class social environment with doctoral students and staff from all around the world.

Prospective applicants are encouraged to contact the Supervisor before submitting their applications. Applications should make it clear the project you are applying for and the name of the supervisor(s).

Academic qualifications

A first degree (at least a 2.1) ideally in computer science or closely related discipline with a good fundamental knowledge of blockchain and cryptography but this is not a requirement.

English language requirement

IELTS score must be at least 6.5 (with not less than 6.0 in each of the four components). Other, equivalent qualifications will be accepted. [Full details of the University's policy](#) are available online.

Essential attributes:

- Experience of fundamental computer science with strong programming skills.
- Competent in software engineering fundamentals and preferably cryptography

<p>math</p> <ul style="list-style-type: none"> • Knowledge of Click here to enter text. • Good written and oral communication skills • Strong motivation, with evidence of independent research skills relevant to the project • Good time management 	
Indicative Bibliography	<p>Regner F, Urbach N, Schweizer A. NFTs in practice—non-fungible tokens as core component of a blockchain-based event ticketing application.</p> <p>Rehman W, e Zainab H, Imran J, Bawany NZ. Nfts: Applications and challenges. In 2021 22nd International Arab Conference on Information Technology (ACIT) 2021 Dec 21 (pp. 1-7). IEEE.</p> <p>Brown Sr, Rodney, Soo Il Shin, and Joo Baek Kim. "WILL NFTS BE THE BEST DIGITAL ASSET FOR THE METAVERSE?." (2022).</p> <p>Pierro GA, Sawaf M, Tonelli R. Original or Fake? How to Understand the Digital Artworks' Value in the Blockchain. In International Conference on Software Engineering and Formal Methods 2022 (pp. 76-85). Springer, Cham.</p> <p>Cupi G. The Internet of Value and the Circular Economy. In Enabling the Internet of Value 2022 (pp. 137-143). Springer, Cham.</p>
Enquiries	For informal enquiries about this PhD project, please contact Zakwan Jaroucheh (z.jaroucheh@napier.ac.uk)
Web page	https://www.napier.ac.uk/research-and-innovation/research-degrees/application-process