Fetch.AI - University of Birmingham 2019 MSc Project Internship

In the context of the final masters project of the MSc Computer Science/MSc Advanced Computer Science/MSc Cyber Security programmes of the School of Computer Science of the University of Birmingham, Fetch.AI is offering **3 internships** to be working on projects on artificial intelligence/cryptography/digital economics.

Fetch (www.fetch.ai) is an artificial intelligence and digital economics startup based in Cambridge. These projects internships will be mentored and overseen by Dr David Galindo (Head of Cryptography, Fetch.AI and Senior Lecturer in Computer Security, University of Birmingham) and possibly co-supervised by Fetch.AI employees.

Further details:

- 3 places are offered under this summer project internship scheme
- Selected students are expected to spend 1 or 2 days a week during their summer project at Fetch.AI premises (St. John's Innovation Centre, Cowley Road, CB4 0WS, Cambridge, UK)
- Selected students will need to ask for Fetch.AI permission if they want to make their project reports public
- Selected students will be provided with financial help for travel, accommodation and daily subsistence expenses for commuting between Birmingham and Cambridge

How to apply:

- Submit a CV (two pages) and covering letter (one page) to david.galindo@fetch.ai and info@fetch.ai with subject letter “Fetch-Birmingham Summer Project”
- Explicitly mention up to 2 projects from the offered projects that you’d like to work on

Responsibilities (to the extent they are aligned with your MSc final project requirements):

- Conduct research and/or experiments related to artificial intelligence/cryptography/digital economics in the assigned project
- Design, implement, and evaluate novel solutions for improving distributed systems, machine learning algorithms or economics models
- Collaborate with researchers and engineers at Fetch.AI to push forward research and technological agendas in a collaborative and supportive environment

Projects Proposed by Dr David Galindo/Fetch.AI (Cambridge)

Building a Blockchain-Based Private Data-Sharing System using Ocean Protocol Architecture (supervised by Dr David Galindo).

The core idea is to build a privacy-preserving data sharing system using the Ocean Protocol toolbox:

- Whitepaper https://oceanprotocol.com/tech-whitepaper.pdf
- Documentation https://docs.oceanprotocol.com/

Compare the result with existing academic proposals, such as:

- zkLedger: Privacy-Preserving Auditing for Distributed Ledgers

Advanced goal: can you suggest improvements on either approach (i.e. Ocean or zkLedger) based on what you have learned from the other approach?

Pushing the limits of privacy-preserving machine learning (supervised by Dr David Galindo).

The question to be answered is: how far can practitioners go when implementing privacy-preserving ML using off-the-shelf open source libraries? Building on Intel HE transformer for nGraph AI software library, build, test and benchmark new designs for neural networks fed with encrypted data. This project involves understanding (but not designing) advanced mathematics, such as lattice-based cryptography. You can find existing PoCs at https://github.com/NervanaSystems/he-transformer

Analysis and comparison of Bitcoin/Ethereum Transaction Networks (co-supervised by Dr Jenny Wong).

This project will entail building a network graph of users, which correspond to nodes in the graph, and their transactions (edges) using the transaction data from Bitcoin's (or Ethereum) blockchain and studying properties of this network. In particular, it would be interesting to investigate the degree of clustering in the network, connectivity between clusters and possibly understand the origin of the clusters e.g. do they correspond to particular market places on the network? These properties can then be used to compare the blockchain transaction network with known models for social networks.

TBA. A 4th project will be announced soon.