Sam Dunning <info@ukctransparency.org>

RE: FOI request, IMPFOI-24-012

IMPFOI <foi@imperial.ac.uk>   6 February 2024 at 11:16
To: Sam Dunning <director@ukctransparency.org>

Dear Sam Dunning,

Thank you for giving us the opportunity to review the College's response to your Freedom of Information Act request. Your Internal Review request related to the College's refusal to provide a copy of the agreement between Imperial College and CSIC/JARI and our failure to outline the proposed projects. Specifically, you asked for disclosure of:

1. Any list of projects provided for

2. An overall mission statement for the Innovation Centre and a statement of its goals

3. Details of the nature of collaboration provided for

4. Details of the governance of the collaboration provided for/ the Centre

The agreement listed the proposed projects. I attach a copy of that part of the agreement (we have removed names and other information that could identify the individuals referred to in the document).

The overall purpose of the agreement and nature of the collaboration, as stated in the agreement, was:

The Parties have a mutual interest in establishing a world-class research centre in the Data Sciences Institute at Imperial for the study of Ocean Engineering and to promote their collaboration in the fields of data science, AI, computer vision, intelligent manufacturing, novel material and craft by exploring the unique advantages of their technologies and applications for civilian usage, setting up a complete technical collaboration mechanism.

The Parties will work in close collaboration in forms of technical exchange and technology purchase.

The contractual terms contained in the agreement form the "details of the governance of the collaboration" (point 4 above). We are not willing to disclose the contractual terms agreed because disclosure of the terms would be likely to prejudice the College's commercial interests. Disclosure of the terms of this agreement would be likely to adversely affect the college's position in future negotiations with potential research collaborators. Such collaborations are a significant source of income for the College in addition to contributing to the College's position as one of the world's leading research universities. Furthermore, the details of the precise terms on which we engage with research collaborators would be of significant interest to our competitors; disclosure would undermine the College's ability to compete fairly in this market.

When applying the exemption at Section 43, we must consider whether the public interest would favour disclosure in this case, despite the prejudice identified. You have stated that there is a clear public interest in research collaborations with China. We accept that there is a public interest in research collaborations with China and have disclosed to you (and other FOI requesters) detailed information about such collaborations. We do not accept that the public interest in these matters requires disclosure of the exact terms on which Imperial College enters into research collaborations. Our view is that the information disclosed to you previously and in this further response is sufficient to satisfy the public interest in this matter.

If you are unhappy with the outcome of my review of your request, you have the right to complain to the Information Commissioner's Office.

Yours,

Schedule 1 – Research Project Descriptions

Jiangsu Automation Research Institute/China Shipbuilding Industry Corporation – Imperial College London

Future Digital Ocean Innovation Centre

The research will focus on the fundamental technologies and platforms for data science and machine learning. All the research results will be open for publications and software without proprietary data will be made for public access based on a proper open source licence. The following research projects are discussed as the main focus:

1) <u>Ocean Data Assimilation</u>

<u>Field: Marine and ocean ecosystems forecast modelling.</u>

Data assimilation refers to the process of combing observational data with outputs from a numerical model to produce an optimal estimate of the evolving state of a dynamic system. With recent developments of observing systems and ocean modelling, data assimilation is now one of the most promising methods that brings together large-scale ocean observation data with sophisticated dynamical models to describe the time-varying ocean state.

The Innovation Centre will develop state-of-the-art data assimilation approaches, which include a set of mathematical models and computational tools, to study ocean dynamics. The uncertainties in the current ocean models, the representation and processing of model and observation errors, and the efficiency and robustness in real-time assimilation system will also be intensively investigated. The approaches developed in this project may greatly improve the ability of current ocean models, and can be applied to marine and ecosystem forecasting, climate prediction and studies of the carbon cycle. The Innovation Centre will further couple the ocean data and atmosphere data to address the challenge of coupled ocean-atmosphere data assimilation.   The DSI has an extensive experience in this field.

2) <u>Blockchain in Logistics</u>

<u>Field: Transactions and security in block chain contracts for ocean logistics in trade.</u>

Blockchain is a distributed ledger technology that can record transactions between untrusted parties in a secure and permanent manner. Because of its immutable nature and the associated security and privacy benefits, blockchain has great potential to improve the current ocean logistics in global trade.

The Innovation Centre will design and develop an open platform for ocean shipping and logistics by leveraging blockchain and smart contract technologies, aiming to boost supply chain transparency and automate administrative operations. A new decentralised system for storing large-scale real-time data will be developed to provide real-time tracking to shipping data and shipping documents. The Centre will research on the confidentiality, efficiency and scalability of public and permissioned blockchains to overcome the performance bottlenecks of existing blockchain-based solutions. As the business logic of shipping will be implemented in forms of smart contracts, the Innovation Centre will also investigate the security vulnerabilities of smart contracts and develop tools to detect vulnerability patterns through formal verification. The DSI has been working in this field in last 5 years and has established a world leading reputation.

3) Distributed Deep Learning

Field: Distributed deep learning for ocean-atmosphere datasets.

With more large-scale ocean-atmosphere datasets become publicly available, it is of paramount importance to run deep learning models on distributed data processing engines like Apache Spark. Current mainstream deep learning frameworks, such as TensorFlow, Caffe and PyTorch, are great for training various neural network architectures, but their support for pipelines on large datasets are still very limited.

The Innovation Centre will develop and implement a unified distributed and parallel deep learning framework to provide efficient training of deep networks with massive data. The framework will be built by taking advantage of Apache Spark and the TensorLayer system, a high-level modular wrapper of TensorFlow. The system supports a concurrent learning approach of training multiple neural networks and have the mechanism to automatically distribute workloads and parameters to TensorLayer running nodes in parallel via Spark, parallelly train deep networks and iteratively aggregate training results. Use cases on ocean data inference will be performed to demonstrate the ability of the framework to efficiently handle massive data and parameters involved in deep learning models. DSI developed the award winning TensorLayer and has a rich experience on developing TensorLayer-based distributed deep learning applications.

4) Integrated Ocean Data Management and Visualisation

Field: Integrated data management and visualisation for ocean data.

CSIC/JARI is the owner of world's largest ocean data sets. Integrating highly heterogeneous ocean data sources is a major research challenge. DSI has rich experience in data integration and harmonization of medicine data. Such an expertise will be very beneficial for the Innovation Centre to investigate novel methods in integrating heterogeneous ocean data

sources and manage the integrated data on an open source platform for data custodianship, sharing and discovering. Visualisation of ocean data will be implemented as an interactive visual analytics application on the Data Science Institute's Data Observatory and naked eye 3D screens.

5) Machine Learning Applications in Transportation

<u>Field: Intelligent logistics for Ports.</u>

Machine Learning Applications in Port Transportation and Logistics The innovation centre will apply its developed machine learning technology to port logistics. The Port application will mainly focus on the intelligent control of port assets. CSIC has proprietary technology on intelligent traffic management which can be augmented using environmental sensors dockside. A particular focus will be in applying machine learning technology for optimizing flows and routes of traffic and movement of goods to maximise efficiency while minimizing pollution.