**PhD Project Proposal**

School of Electronics, Electrical Engineering and Computer Science

& ECIT Global Research Institute

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| **Proposed Project Title: Blockchain-based Trust Mechanisms for Future Clouds** |
| **Principal Supervisor: Dr Blesson Varghese Second Supervisor: Prof Dimitrios Nikolopoulos** |
| **Project Description**: Future clouds will utilise computing capabilities outside a data center to make applications smart and fast. These applications will be distributed across a cloud data center and resources located at the edge of the network, such as micro clouds or Internet gateways, referred to as edge nodes.  An application on an edge node will service a rich variety of mobile users and their gadgets, such as smartphones, wearables and other sensors directly. When a user moves from one location to another the application servicing the user will also need to move from one edge node to another.  The key challenge in moving applications from one edge node to another is that mechanisms of trust will need to be rapidly established between the nodes. While blockchains are a promising technology to address this, it is currently unknown how blockchains can be used on Edge resources and what underlying algorithms will need to be developed to facilitate this.  The aim of this project is to develop transformative technologies at the software level to enable trust for rapidly moving applications between edge nodes. Research literature will be surveyed and blockchains in the context of networked embedded boards, such as Odroid or Raspberry Pis will be considered. Some of the key questions that will be considered will include – ‘how can blockchains be used for a very large collection of edge nodes?’ ‘what mechanisms are required for rapidly establishing trust?’ ‘what are the influences when moving an application that affects trust?’ The primary goal of the project on establishing trust between edge nodes will be pursued by designing, developing and deploying novel algorithms underpinning blockchains.  The scope of this project is flexible – the candidate may choose to define it based on their interest. |
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