**Project Title**: Efficient and Secure IoT-Based Protocol for Smart Meters in the Smart Grid

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**Project Description**:

This project has two phases. First phase work will be carried out in the upcoming semester (Feb.-Jul. 2017). We will expand this project for the next semester/year as well for the second phase of the work. This fund covers the first Phase which will involve a proposal of a security protocol for IoT devices (smart meters in the smart grid) and its implementation (a prototype) to verify protocol performance. The protocol will support real-time communications, resilience to overload/ deteriorate situations, scalability and high performance, QoS, dynamic environment, and secure end-to-end communications. The first phase will provide the necessry background for the second phase that will involve the development of intelligent algorithms to provide predictive and adaptive maintenance and system analysis in order to help consumer to optimize energy loads with optimum price in the power grid system. First Phase Project Goals: (i) a new protocol for efficient and secure communications between the smart meters and the control center for exchanging dynamic price information as well as the physical smart meter information, and (ii) a prototype implementing the security protocol.

* Feb. 2017: Related work investigation in depth, Implementation platform analysis
* Mar. 2017: General functionality prototype: selection of platform and other resources, and code development start,
* Security protocol development start
* Apr. 2017: Protocol implementation start and adding functionalities, Protocol verification start
* May. 2017: Security analysis of the protocol: attacks prevention and security proof
* Jun. 2017: Performance analysis of the protocol: execution time and overhead analysis
* Jul. 2017: Protocol verification complete, Prototype implementation complete

**Research Assistant**: an **graduate** research assistant (RA) to support the implementation of the idea and other functionalities of the protocol.

**The set of required skills include:**

Knowledge and expertise of Java, understanding of client-server programming interfaces, familiarity with any IoT platform, such as KAA, will be advantageous.

**Hourly rate: £**12.12

**Number of hours:** 160 Hours