**Justification of Resources**

**Directly Incurred – Staff**

**Co-I.** Aydin Abadi will work full-time on this project. He will be responsible for devising the cryptographic protocols, proving the security of protocols, implementing the protocols, and conducting security analysis. He will take the lead in writing publications and presenting them at conferences and seminars.

**Technician: 10% FTE.** The UCL Department of Computer Science charges technical projects, such as this, 10% of a technician’s time to support the procurement, development, and installation of services; these are services above and beyond the normal IT-style services that are provided by the department. In particular, in this project we are using substantial computer resources (i.e., UCL high-performance clusters) which need to be maintained and adjusted by the IT support.

**Directly Incurred – Travel and Subsistence: £22,700.00**

**Conference attendance (£57,800).** 8 international conferences at £2,500 per conference [£20,000];

6 UK conferences/seminars at £450 per conference/seminar [£2,700]. It is important for the success of the project that the results are disseminated at national and international conferences and seminars. Presenting our research findings at conferences/seminars will increase the academic impact of this research project. Moreover, it will create opportunities to expand the research network and collaborate with other researchers. Thus, the PI and Co-I will attend (security, privacy, or cryptography) conferences such as FC, ACM CCS, and USENIX Security. Also, the PI and Co-I will attend national conferences and seminars (e.g., REPHRAIN seminars, and Payment Systems Regulator seminars) to present their work, exchange knowledge, and create opportunities for partnerships. They will attend on average 2 conferences/seminars in the UK, each year. They will attend 2 international conferences in the first year; however, they will attend 3 international conferences every year after that, as they expect that they will produce more publications after the first year.

**Directly Incurred – Other: £11,600**

**IT consumables (£2500).** A high-performance laptop at £2,500 for the team to implement the prototypes and perform run-time evaluations. Since the team needs to implement cryptographic protocols which often demand high levels of processing power, memory, and storage space, we request a high-performance laptop.

**Public engagement (£7,600).** It is important to create a discussion environment so regulators and researchers can gather and discuss solutions and barriers for/to improving cryptocurrency systems. Thus, the PI and Co-I will run two 2-day seminars in London and invite regulators and researchers to present their work and discuss the main questions that the research project will answer. This will increase the research impact and increase the possibility that our research findings will be adopted in the real world. Costs include event facilities and catering for 30 people at £40 per person/day [£4,800]. For the project, we will set up a website with the following costs: Website design and maintenance [£2,500] and Website hosting for 24 months [£300]. The website will act as a central scientific hub for the latest related publications and findings.

**Public engagement events in Cardiff, Edinburgh and London (£1,500).** In addition to disseminating the research findings via the website and social media accounts, the PI and Co-I will share the findings directly with the public, by presenting them at the science festivals taking place in London, Cardiff, and Edinburgh. They will inform and educate the public about cryptocurrency payment fraud. They will also give non-technical presentations about the solutions that we will develop to deal with online payment fraud. The related costs for 2 people include travel to Cardiff and Edinburgh, accommodation in Cardiff and Edinburgh, subsistence in Cardiff and Edinburgh [£1,000], and flyers and posters [£500]. The posters and flyers will be used to disseminate the research findings to the public.