VeTSS RESEARCH INSTITUTE IN VERIFIED TRUSTWORTHY SOFTWARE SYSTEMS

Imperial College London

EPSRC Engineering and Physical Sciences Research Council

FUNDING CALL: VERIFIED TRUSTWORTHY SOFTWARE COMPONENTS

Closing date: 21st December 2018, 12:00 *Funded by the National Cyber Security Centre (NCSC)*

BACKGROUND

The Research Institute in Verified Trustworthy Software Systems (VeTSS, https://vetss.org.uk), hosted at Imperial College London, is a UK Academic Research Institute in Cyber Security, funded by the Engineering and Physical Sciences Research Council (EPSRC), 2017-2022. This VeTSS funding call is for approximately £0.5M to be spent between 1/4/2019 and 31/3/2020, funded by the National Cyber Security Centre (NCSC). Projects extending for longer periods of time will also be considered, including proposals for PhD studentships that extend for 3.5 years.

THE CALL

Modern computer systems provide unprecedented benefits to society, science, technology and health, making their reliability and security of crucial importance. However, current methods for establishing such trust in our software are insufficient; system faults are pervasive, resulting in privacy violations, intellectual and monetary theft, and even loss of life. Verification techniques, in their broadest sense, are essential for validating the reliability and security of our international software infrastructure.

This VeTSS funding call is on `Verified Trustworthy Software Components', although proposals that focus on analysis, testing and verification in general will also be considered. The key challenge is to verify important parts of our software infrastructure, and understand how these verified parts interact with the rest of the infrastructure. Proposals should address fundamental problems in the area including, but not limited to:

- **Lightweight verification for the general programmer**. Mainstream developers are benefiting from scalable, lightweight verification tools used inside the large, open systems of technological giants such as Amazon, Facebook and Google. Such techniques are currently limited to simple bug-finding. This call is interested in proposals that explore compositional verification techniques in general, and their application to the continuous, iterative model of software development increasingly used in industry.
- **Full verification for specialist software**. Examples include the verified microkernel seL4, the verified C compiler CompCert, the verified autonomous helicopter software for the DARPA HACMS project built on seL4, and the verified UK air-traffic control system developed by Altran. Despite these successes, the full verification of specialist software requires Herculean effort. This call is interested in proposals that explore verification of specialist software, paying particular attention to understanding how such verification can be simplified, extended, maintained and integrated within the wider software infrastructure.
- **Verification for open-source software.** Examples include the analysis of important open-source software such as Linux, and the mining and understanding of open-source software enclaves explored, for example, in the DARPA MUSE project. As well as proposals for verifying specific examples of open-source software, this call is interested in proposals that explore the development of verification environments for software enclaves that aid in the building, maintaining and understanding of open-source software.

These particular problems are by no means comprehensive. The expectation is that proposals for this call will address numerous problems associated with the aim of placing verified trustworthy software components within the overall software infrastructure.

PROPOSAL DETAILS

VeTSS would like to support excellent proposals that are perhaps more difficult to fund through EPSRC and industry: examples include proposals transferring technology from academia to industry; proposals on ambitious blue-sky research as a step towards more standard funding; and proposals focussing on the development of properly

engineered tools rather than cutting-edge research. VeTSS would also like to encourage proposals for Ph.D. studentships for 3.5 years, up to the normal cost of an EPSRC studentship. Guidance for candidate eligibility for PhD studentships can be found here. Finally, VeTSS would also support proposals for bringing talented international PhD students/RAs/academics to spend time with UK research groups, proposals for international workshops, and proposals for continuity funding for previously funded VeTSS projects, although the expectation is that these projects will be further funded through EPSRC and industry.

This is the third VeTSS call. The first and second calls were highly competitive. Proposals should provide evidence of engagement with the international academic or industrial verification community, or the UK industrial community interested in applying such techniques to industrial practice.

APPLICATION GUIDELINES.

The application process for this call is deliberately lightweight. The submission should contain:

- A 3-page project proposal with an additional page for references, following EPSRC formatting guidelines: the font should be 11 point Arial or Helvetica, with 2 cm margins.
- 2-page CVs of the investigators and named researchers including: a list of current and past grants and a web link to publications.
- A separate list of publications relevant to the proposal.
- A 1-page detailed breakdown of costs, by year, with justification including, for example, investigator time, equipment, travel and expenses. Prices should be quoted without VAT. The research will be funded at 100% Full Economic Cost and will cover overheads, estates costs and any applicable indirect costs.
- In the case of studentships, the EPSRC rules will apply: funding will cover 100% of stipend and fees at RCUK levels but not cover estates and indirect costs nor student supervision costs. Travel and subsistence and other related costs for the student are permitted.

The expectation is that the costs will be between £50–£100K per proposal.

ELIGIBILITY AND CONDITIONS

The PI must be eligible to apply for EPSRC funding. Only one proposal will be accepted per PI. The investigators of projects funded in this call are expected to become core VeTSS members and to play an active role in VeTSS. They are required to complete a final report. The funders are committed to full and open publication of the research outputs of VeTSS in line with normal academic practice. The funding and contract will be under the NCSC's standard terms and conditions; a draft copy of the contract can be made available on request.

APPLICATION AND SELECTION

Applications should be sent to Teresa Carbajo Garcia by ***noon on Friday 21st December 2018.*** Proposals will be assessed by a panel of verification experts from academia, industry and government, who will judge the proposals on quality, viability and significance. Enquiries regarding the academic scope and objectives of this call should be directed to Dr Petar Maksimovic, Academic Program Manager of VeTSS. Enquiries regarding the application process should be addressed to Teresa Carbajo Garcia, Administrative Program Manager of VeTSS.

KEY DATES:

CALL PUBLISHED	*6th November 2018*
PROPOSALS SUBMITTED	*21st December 2018 by noon*
RESULT ANNOUNCEMENT	*By 4th February 2019*
RESEARCH PERIOD	*1st April 2019 – flexible end-date*