



# Proposal for New Degree Programme

## Stage 1

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## OVERVIEW OF PROGRAMME

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ABOUT THE PROGRAMME		
<b>Title of programme</b>	PhD in Cyber Security, Privacy and Trust	
<b>Intended Award</b>	PhD	
<b>Alternative awards</b>	N/A	
<b>School</b>	School of Informatics	
<b>Programme Director</b>	Prof. David Aspinall, Prof. Aggelos Kiayias, Dr. Tiejun Ma, Dr. Kami Vaniea	
<b>Programme start dates</b>	01/09/2019.	
<b>SCQF level of highest award</b>	12	
<b>Total credit value of programme <i>(for highest award)</i></b>	540	
<b>Partner institution(s) if any</b>		
<b>Mode of delivery</b> <i>(Please ✓ those which apply to this programme)</i>	On campus	✓
	Online	
	Blended learning	
	FT	✓

	PT	✓
	Intermittent	
<b>Expected length of programme</b>	FT	<b>3 years</b>
	PT	<b>Pro-rata</b>
	Intermittent	
<b>Description of the programme and its structure (maximum 150 words)</b>		
<p>The proposed PhD is a 3 year programme offered by the School of Informatics led within its Security, Privacy and Trust group. The purpose of the programme is to build on the recent strategic growth in cyber security research inside Informatics, including topics in secure and trustworthy systems, network security, cryptography, distributed ledger, hardware security and privacy enhancing technology. The broader aim is to encourage productive collaborations and interactions needed to deliver a step change in addressing problems related to trust, identity, privacy, and security in digital systems. The approach envisioned will include peer mentoring, developing a sense of group cohesion, peer-to-peer and student-led learning, a rich events programme, and a physical environment designed to encourage research interaction. As well as the core research activity inside the School of Informatics, the programme will encourage multidisciplinary topics particularly involving supervisors from schools who are part of the University's Academic Centre of Excellence in Cyber Security Research (ACE-CSR), currently Law, Business, Political Science, Design, Engineering and Mathematics. (The University of Edinburgh now has probably the largest academic cyber security research group in the UK, built over the last 5 years.)</p>		
<b>Career, employability and opportunities for continuing professional development.</b>		
<p>The increasing reliance of systems and services on information technology in the public, private and third sector has significantly increased the impact of cyber attacks in the last two decades. This PhD programme in Cyber Security, Privacy and Trust is a response to the growing need for highly specialized training in this area. Industry recognises a critical skills gap across all levels in cyber security. A recent employer survey (Frost &amp; Sullivan, 2017) projected a shortfall of 1.8 million unfilled vacancies by 2022. The programme will produce the next generation of cyber security leaders with in-depth technical knowledge and the necessary breadth to provide solutions to cyber security problems that require interdisciplinary understanding how business processes, cost, usability, trust and the law play a role for effective technology deployment.</p>		

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## BUSINESS CASE

This section should be used to outline the business case for the proposed programme. Before completing this section market research should have been undertaken.

STRATEGIC PLANNING, RECRUITMENT & COMPETITOR ANALYSIS	
<b>Programme Title</b>	PhD in Cyber Security, Privacy and Trust
<b>Programme Proposer</b>	Prof. David Aspinall, Prof. Aggelos Kiayias, Dr. Tiejun Ma, Dr. Kami Vaniea.
<b>Strategic Planning</b>	We will offer a comprehensive PhD programme in Cyber Security Privacy and Trust, which is an area of critical importance and well recognised as a national need. The funding will be provided through a range of sources, including specific project funding from research projects, industrial and public sector collaborators (e.g., the PhD scheme run by NCSC open to ACE-CSR Universities, the donation from IOHK in the Blockchain Technology Lab, funding pledges from a number of companies), as well as the EPSRC DTP. A number of students are likely to be self-funded, particularly including international students who are supported by government schemes to grow cyber security expertise in their home countries (currently including South East Asia, Middle East, and China). We expect an intake of 6-8 students per year, depending on funding availability. We plan to seek further baseline funding for unrestricted studentships from a range of sources, once the programme is established.
<b>Recruitment</b>  <i>Please provide a detailed commentary on your marketing and recruitment strategy.</i>	Demand for experts in security, privacy and trust is extremely high. University of Edinburgh already attracts PhD high quality applicants but current recruitment is hampered by the lack of a dedicated PhD programme. Introducing this programme will open the standard recruitment routes, as well as allowing development of a new strategy. Edinburgh Innovations are helping build a communications and marketing strategy for the University's activities in Cyber Security, it is expected that this will help with recruitment. One feature of this programme is that applicants with various different backgrounds may be included, including legal, business, economics and political science. The marketing strategy should highlight the importance of cyber security skills in these disciplines, as well as its wide applicability across different sectors. We anticipate that our existing programmes will benefit from the proposed programme given its

	complementarity and its high profile while there will be no negative effects. The graduates are expected to find employment both in academia and in industry.			
<p><b>Competitor Analysis</b></p> <p><i>A competitor analysis report provides a better understanding of the marketplace and competition, from the going rate for tuition fees to the unique selling points and marketing strategies of competitor programmes.</i></p>	We consider as competitors to this programme to be the top PhD programmes in the US, including those at Stanford, CMU and MIT. In Europe there are strong programmes at a number of locations, for example, ETH in Switzerland and Darmstadt in Germany. In the UK there are competitor programmes in the south of the nation, particularly the EPSRC CDTs at Bristol, Royal Holloway and UCL which are starting in 2019. However, the critical skills shortage in industry and demand across all levels, including PhD, means that we do not expect over capacity. In terms of UK competition, our research output in the area is among the top (probably exceeding Oxford, equalling UCL). We believe we have the capability to attract top students even without a CDT, if we have good marketing.			
<p><b>Competitor Fees</b></p> <p><i>Provide the fee structure (in British pounds) of three competitors, preferably those mentioned in the competitor analysis. These may be UK or International competitors.</i></p>	Institution	Programme	Fees	
			Home	International
	MIT	PhD	£40525	£40525
	Oxford	PhD	£7730	£23950
	Stanford	PhD	£42460	£42460

FEES AND COSTING		
<p><b>Programme fees</b></p> <p><i>Fees are expressed per academic year in British pounds. For PGT programmes, a Programme Costing Template will also be required for Fee Strategy Group.</i></p>	Home-Scotland / EU	£4260 (TBC)
	Home-RUK	£4260
	Overseas	£23000

Fees for each new PGT programme are sent by College to the Fee Strategy Group (FSG) for review and approval. The FSG has developed a Programme Costing Template to give FSG insight into the anticipated profitability of a programme and where it sits within its market. The Fees Costings template, and guidance from FSG on filling out the template is included in the spreadsheet attached to the right.



**Additional Programme Costs (PGR only)**

*Additional costs to the student should be noted and justified in the table below. These should consist of items that are over and above the basic provision that should be available to all students and should reflect the special additional costs associated with the specific programme of study. Individual items over £200 should be noted on a separate row.*

Item	Cost	% of Total
Travel	£800	100
Computing costs	£200	100
<b>Total:</b>		100%

**ANTICIPATED AND PROJECTED ENROLMENTS**

*What are the anticipated and projected enrolments over the next three years?*

	Year 1	Year 2	Year 3
<b>Home</b>	<b>3</b>	<b>4</b>	<b>4</b>
<b>International</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>Supporting Research</b>  What market research has been planned or completed to support the predicted student numbers?	Year 1 figures are based on students who are due to start PhDs in Informatics, currently assigned to other programmes but who may change to the new programme once it is available. The projections are reasonable expectation of growth assuming funding		

<b>PLANNING AND RESOURCES</b>	
<b>New Courses</b>	n/a
<b>Facilities and Equipment</b>	The students will be accommodated in the Bayes Centre. Computing equipment and other facilities will be supplied from existing Informatics Graduate School resources (cost recovery from fees), as well as project specific funding where specialised equipment is required. No additional library resources will be required.
<b>Staff</b>	Administrative and support staff will be funded by cost recovery from fees within the Informatics Graduate School. We will seek additional core funding as the programme grows, and in conjunction with the partner industry supported 4 year programme. A wide range of supervisors are involved from Informatics and other Schools so the risk created by staff changes, retirements, and sabbaticals is low.
<b>Resource Sharing</b>	This program will share resources with the existing CDT programmes in Informatics. Some resources sharing between CDTs at the college level is also anticipated. Course organizers of relevant courses have not been consulted, but we don't anticipate any problems, as the number of students in this program is small (10 per year).

<b>COLLABORATIVE PROGRAMMES</b>
<p>Additional information is required for new programmes that are collaborations with external institutions or organisations which will result in a joint award and/or where taught components are shared. International partnerships must have a Memorandum of Understanding (MoU) in place before the programme can be approved by College.</p> <p>Should the proposal be progressed to Stage 2 a draft Memorandum of Agreement (MoA) will need to accompany the submission.</p> <p>Separate guidance is available for the development of collaborative programmes.</p> <p><a href="http://www.ed.ac.uk/governance-strategic-planning/collaborative-activity/guidance-templates">http://www.ed.ac.uk/governance-strategic-planning/collaborative-activity/guidance-templates</a></p>

## CONSULTATION AND APPROVAL

<b>Programme Title:</b>	PhD in Security, Privacy and Trust
<b>Programme Proposer:</b>	Dr. Tiejun Ma, Prof. Aggelos Kiayias, Dr. Kami Vaniea.

### STAGE 1: CONSULTATION

Please confirm consultation with relevant stakeholders has taken place.

Stakeholder	Yes	NA
School Director of Professional Services	<input checked="" type="checkbox"/>	<input type="checkbox"/>
School Academic Administration Staff	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Information Services (including Academic Support Librarians)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Student Body (SSLC/Student representatives)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Partner School Staff (E.G. Joint Programmes/shared courses etc)	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Employers	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Industry and Professional Bodies	<input type="checkbox"/>	<input checked="" type="checkbox"/>
External Consultation	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Please note any other consultation		

Please provide a brief comment on the consultation process

This programme is revision of a programme based on a CDT proposal which was comprehensively vetted at the College and School levels before it was submitted to UKRI.

Please provide a brief comment on the consultation process with External consultants

The proposal was subject to external peer review as part of the UKRI CDT selection process. Most comments were positive; one review emphasised the need to strongly support interdisciplinary research.



### STAGE 2: SCHOOL BOARD OF STUDIES REVIEW AND APPROVAL

Confirmation of approval of the proposal at the School Board of Studies should be entered below.

Date of BoS:
Convener Name:
Comment and Approval (BoS Minute): <i>Please provide either a link to the minutes of the Board or a copy of the relevant text from the minutes.</i>

### STAGE 3: HEAD OF SCHOOL REVIEW AND APPROVAL

Head of School: <i>Please print name</i>
Comment and Approval:
Signature:

### STAGE 4: COLLEGE CURRICULUM APPROVAL BOARD REVIEW AND OUTCOME

Date of CCAB:	
Convener Name:	
Stage 1 Outcome (please select as appropriate)	
Permission to proceed to Stage 2	<input type="checkbox"/>

Permission to proceed to Stage 2 with conditions	<input type="checkbox"/>
Proposal rejected with recommendations	<input type="checkbox"/>
Proposal rejected	<input type="checkbox"/>
Comment:	

### Document Control

Date approved: Start date:	Amendments:	Date for next review:
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If you require this document in an alternative format please email: <a href="mailto:deanga@exseed.ed.ac.uk">deanga@exseed.ed.ac.uk</a>		