### FindAPhD Project Template

**School of Electrical Engineering, Electronics and Computer Science**

**Department Name:**

**Supervisor(s) and their email address (2 max):**

<table>
<thead>
<tr>
<th>Professor Simon Maskell</th>
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<tbody>
<tr>
<td>Professor Laurence Alison</td>
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**Funding Status (select from below drop down menu):**

- Directly Funded Project (UK/European Students Only)

**Application Deadline:**

- 30 May 2018

**Project Title:**

**Smarter Experiments for the Lab of the Future: Man and Machine Knowledge Integration (ICASE with Unilever)**
Unilever employ experienced people and have large repositories of historic experimental data. This project relates to combining the information inherent in these contexts to help optimise decisions about which experiments to conduct in the future. More specifically, this project will develop tools to support such decision making.

Mature techniques can solve parts of this problem. Indeed, psychologists have developed Structured Thinking Techniques (STTs) to help mitigate cognitive biases when capturing human expertise. Similarly, data scientists have developed statistical methods for analysing data. However, there is relatively little research that is genuinely at the interface between these two disciplines and which attempts to synergise the views taken by the two communities of academic researchers.

This project aims to develop decision support tools that explicitly pull on both psychology and data science. This will involve careful statistical modelling of the process of asking questions of experts as well as careful analysis of the psychology of using interface to state-of-the-art data science.

The project pulls on previous research on developing such tools in defence and security contexts. This project is focused on understanding how to configure such tools to deliver benefit in the context of high-volume, high-value manufacturing processes, exemplified by those of relevance to Unilever.

Prof Simon Maskell (see: www.simonmaskell.com) will lead the supervision of the project at the University of Liverpool. Simon has a growing vibrant team that currently includes PhD students and post-docs with backgrounds in statistics, maths, computer science, engineering, particle physics and psychology working on applications that span, for example, aerospace, cyber security, insurance, healthcare and robotics. Simon will be supported by Prof Laurence Alison (a psychologist), Dr Roberta Piroddi (who has worked with Simon and Laurence on a recent and related project) and Mark Newman (programme director at Unilever for the Materials Innovation Factory, a £72M co-investment by Unilever and the University of Liverpool).

Engagement with and contribution to the state-of-the-art are anticipated and the student will gain international exposure by presenting at top-ranked conferences.
The PhD will be funded for 4 years by an industrial CASE award and includes a top-up of £4500 per year over and above fees and the stipend associated with a standard EPSRC-funded PhD. To be eligible, applicants must be have British or other EU nationality. Extensive collaboration with Unilever is expected.

Name and email address to direct enquiries to:

Simon Maskell, s.maskell@liverpool.ac.uk

List of subject areas (please select the appropriate subject areas the project applies to):

- Engineering
- Acoustics
Aeronautical Engineering
Biomedical Engineering
Chemical Engineering
Civil & Structural Engineering
Electrical & Electronic
Energy
Manufacturing
Materials Science
Mechanical Engineering
Nanotechnology
Nuclear Engineering
Semiconductors
Software Engineering
Telecommunications

Maths & Computing
Applied Mathematics
Bioinformatics
Computational Chemistry
Computer Science & IT
Data Analysis
Information Science
Mathematics
Operational Research
Software Engineering
Statistics

Humanities
American Studies
Anthropology
Archaeology
Architecture & the Built Environment
Asian Studies
Classics & Ancient History
Communication, Cultural & Media Studies
European Studies
Geography
History
Middle East & African Studies
Modern Languages & Linguistics
Philosophy
Theology & Religious Studies

Social Science & Health
American Studies
Anthropology
Architecture & the Built Environment
Asian Studies
Development Studies
Economics
Education
European Studies
Gender & Sexuality
Geography
Health Sciences
History
Middle East & African Studies
Modern Languages & Linguistics
Nursing, Midwifery & Allied Health Professions
Philosophy
Political Science & International Studies
Psychology
Public Health & Epidemiology
Social Work, Social Policy & Administration
Sociology
Sports, Recreation & Leisure Studies
Town & Country Planning

Business & Finance
Accounting & Finance
Business & Management
Economics
Tourism & Hospitality

Law
Law
**Biological & Medical Sciences**
- Agricultural Sciences
- Biochemistry
- Bioinformatics
- Biomedical Engineering
- Biophysics
- Biotechnology
- Botany / Plant Science
- Cancer / Oncology
- Cell Biology / Development
- Dentistry
- Ecology & Conservation
- Endocrinology
- Evolution
- Food Science / Nutrition
- Genetics
- Immunology
- Marine Biology
- Medical / Biomedical Physics
- Medical / Clinical Science
- Microbiology
- Molecular Biology
- Neuroscience / Neurology
- Obstetrics, Gynaecology & Reproduction
- Parasitology
- Pathology
- Pharmacology / Toxicology
- Physiology & Sports Science
- Psychology & Psychiatry
- Public Health & Epidemiology
- Structural Biology
- Veterinary Medicine
- Virology
- Zoology / Animal Science

**Arts**
- Architecture & the Built Environment
- Art & Design
- Classics & Ancient History
- Drama, Dance & Performing Arts
- English
- History
- Music

**Chemical Sciences**
- Agricultural Chemistry
Earth Sciences
- Agronomy & Soil Science
- Atmospheric Physics
- Climatology & Climate Change
- Ecology & Conservation
- Ecotoxicology & Pollution
- Environmental Chemistry
- Environmental Science
- Geochemistry
- Geography
- Geology
- Geophysics
- Hydrology
- Meteorology
- Oceanography