

Small Grants for Research Impact

Applications for a Small Grant to develop and evidence Research Impact are invited

We are pleased to invite applications for a new round of Small Grants for Research Impact.

These grants aim to support the development of emerging and established areas of non-academic impact stemming from research conducted at the University of Hertfordshire.

We would like to support you to engage stakeholders beyond academia - businesses, government, charities, the public etc - in your research. For example, you might consider: attending events to promote your research; facilitating meetings; holding joint events with stakeholders; attending training; creating communications or publicity materials. (But don't be constrained by this list.) Grants can also be used to pay for staff or to buy out time. **A particular priority will be to facilitate the further development of existing Impact Case Study activities.**

Grants are available up to a maximum of £2,500. Please note that applications of all sizes up to this maximum amount will be considered, and value for money will be taken into account. If you have applied for or received one of these grants in previous rounds you are welcome to apply again.

All grants must be fully spent by 31 July 2017. An end-of-project report on activities and outcomes must be provided by 15 August 2017.

Please contact Catherine Manthorpe (Head of the Research Office) ext 3386, c.manthorpe@herts.ac.uk if you would like to discuss your application. **All applications must be received (with approvals) by 1 November 2016**, and successful applicants will be notified by 1 December 2016.

Application Form

Applicant(s)

Name(s):	Paola Amaldi
School(s):	Life and Medical Sciences

Project Summary

Summary of overall project suitable for a lay audience. This summary may be used in either internal or external publications, for example on the UH website.

Summary of project:	<p>Automation in Air Traffic Management (ATM): Guidance on human-technology integration.</p> <p>In the last few years we (Human Factors group at LMS, aka LMSHF) have been actively collaborating with the UK Civil Aviation community to advance the debate about major issues in human-automation interactions during safety-critical operations. As well as being one of the safest industries, air transport is also a sector in which automation has played an increasingly major role in promoting efficiency and improving safety records over the past 30-40 years. Yet problems arising from the interaction between humans and automation have been crucial factors in a number of fatal accidents (such as Flight AF447 from Rio de Janeiro to Paris CdG In 2009). The current debate on human-automation interaction has prompted the UK and international civil aviation communities to refocus on public concerns over unresolved issues as well as the aspirations of stakeholders working at the “sharp end” of day-to-day operations. Within this context, in 2014 LMSHF was invited by the UK’s Civil Aviation Authority (CAA) and National Air Traffic Service provider (NATS) to join an “automation working group” to contribute to the publication of a white paper. This paper included a set of principles and guidelines for use by both the R&D and operating communities as a benchmark for standardising the design, adoption and training for interactive automated systems.</p> <p>https://publicapps.caa.co.uk/docs/33/CAP%201377%20final%20Mar%202016.pdf</p> <p>Prior to its publication in March this year, the final draft of the white paper was discussed in a workshop comprising senior managers in project partner organisations who reviewed the findings and proposals. LMSHF has been heavily involved in collecting the feedback and we produced a first draft of the recommendations from the stakeholders.</p> <p>An initial analysis of the workshop minutes and written feedback suggests that three dynamic factors within organisations contribute to reducing guideline efficiency:</p> <ol style="list-style-type: none">1. Horizontal Feedback - cultural forces within organisations. Poor communication and co-operation across stakeholder domains inhibit integration of human tasks and processes - from choice of concept to operation of the facility, and between the different actors involved in this process.2. Vertical Feedback - political forces within organisations. Linked to cultural forces are political biases within hierarchical levels, which can obstruct bottom-up feedback. Stakeholders at the “sharp end” of operations are disempowered from sharing valuable information with the “blunt end” of
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Please return to **Catherine Manthorpe** (c.manthorpe@herts.ac.uk / 2nd floor Maclaurin Building) no later than **1 November 2016**.

	<p>management that could otherwise have helped to build greater organisational learning and resilience.</p> <p>3. Global language - a general need for a better understanding of concepts about the increasingly complex global network of stakeholders in aerospace.</p>
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Underpinning research

The REF requires impact case studies to be based on original, published research. Please give a brief summary of the underpinning research. It is essential that the research is at the internationally recognised level. Please indicate if it has already been published, or is likely to be published in the next couple of years.

<p>Summary of underpinning research:</p>	<p>Three years ago, a jointly published paper with senior safety manager Smoker at NATS (Amaldi & Smoker, 2013), highlighted concerns relating to automation design and human-technology interaction in air traffic management (ATM). The study reported views elicited from key stakeholders in the aviation industry. Questions included: What could make automation worse/better? Stakeholder feedback was categorised into five broad themes: (1) a lack of vision about future levels of automation; (2) no clear view on responsibility and role allocation; (3) no genuine synergy between human and automation capabilities; (4) no clear vision of operators' skills involved in maintaining a mixed control; and (5) the lack of a validation paradigm to assess the interdependencies of the "total system".</p> <p>This work aroused the interest of other organisations in the aviation sector, including the CAA, Heathrow Airport, and the European Organisation for the Safety of Air Navigation (known as Eurocontrol). As a result, in February 2014 we collaborated with these and other organisations (like European Aviation Safety Agency--EASA, the USA Federal Aviation Administration) in a workshop held by NATS and CAA UK. Human-technology concerns among 66 stakeholders were identified in a focus group spanning various domains (regulators, managers, air traffic controllers, engineers, pilots) and at varying managerial levels in ATM.</p> <p>The data from this workshop were analysed and developed into themes and later published (Quercioli, Amaldi & Smoker, 2015). The themes, which were generated to illustrate possible relationships, associations and inter-connections between the concerns of these stakeholders, also formed the foundation of the CAA guidelines document on human-technology integration (published in collaboration with UH in March 2016 see link given above).</p> <p>In the final workshop held at the time of the white paper's launch, the need for better support in guideline integration was advocated. Some of the hindrances to the integration of the guidelines into the practice of design and training for automation were suggested by our early analysis of automation concerns. However, these were not fully addressed or acted upon after the guidelines were distributed (Quercioli, Amaldi & Smoker in preparation).</p>
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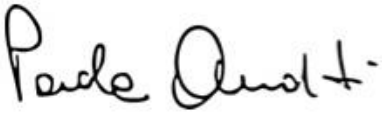

	<p>References:</p> <p>Amaldi, P., & Smoker, A. (2013). An organizational study into the concept of “automation policy” in a safety critical socio-technical system. <i>International Journal of Sociotechnology and Knowledge Development (IJSKD)</i>, 5(2), 1-17.</p> <p>CAA (2016). ATM Automation: Guidance on human- technology integration, Cap 1377, CAA safety and airspace regulation group.</p> <p>Quercioli, M. S., & Amaldi, P. (2015). A Multi-Perspective View on Human-Automation Interactions in Aviation. In <i>Human Work Interaction Design. Work Analysis and Interaction Design Methods for Pervasive and Smart Workplaces</i> (pp. 168-179). Springer International Publishing.. https://hal.inria.fr/hal-01371796.</p> <p>Quercioli, M. S., Amaldi, P. (2016). Socio-Technical Design Systems and Organisational Power Structures: Addressing Growing Complexity in Aerospace. Poster session presented at the Human Factors in Complex Systems Conference, Chartered Institute of Human Factors and Ergonomics (CIHFE) http://www.hf-complexsystems.org.uk.</p> <p>Quercioli, M., S., Amaldi, P., & Smoker, A.J. [in preparation]. “Socio-Technical Design Systems and Organisational Power Structures: Addressing Growing Complexity in Aerospace”</p>
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Summary of activities

What will the grant will be used for, when will this happen and how much will it cost? If applicable, please also give details of any other funding secured or applied for.

Proposed activities with costings:	<p>The CAA conference launch of the ATM human-technology white paper addressed a clear “need” for guidance – particularly on how to address the relationship between humans and automation in safety management systems. However, a number of weaknesses were listed as barriers that weaken the white paper’s impact (see Section 1).</p> <p>The grant would be used to interview stakeholders –with whom we have now established a long lasting and trusting working relationship and with whom we have agreed on the need for a follow up work - to identify further barriers and possible remedies to enhance the spreading and adoption of the White Paper’s guidelines. Some suggestions are already being considered and will be subject to further discussions.</p> <p>The £2,500 cost of the project will cover: Approx £2300 for RA’s time spread over three months (March to May) to interview, transcribe and analyse the data collected during interviews Approx £200 for RA’s expense travel to stakeholders</p>
Other funding:	I will give 0.5 of my time during the data collection phase and 0.1 during the writing up of the paper to be published.

Signatures

Applicant signature:		Date: 30/10/2016	30/10/16
Associate Dean Research signature:	[sign or send email approval] 	Date:	30/10/16