

HHMC 2017 Workshop Report for Surrey IAS

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Introduction

The 2017 Workshop on Hybrid Human-Machine Computing (HHMC 2017) was a 2-day workshop, held at the University of Surrey, Guildford, UK, on 20 and 21 September, 2017. It saw 63 registered participants from 6 different countries (UK, Germany, USA, The Netherlands, Italy, and China). The majority of the participants were from the UK.

When we talk about “computing” we often mean computers do something (for humans), but due to the more and more blurred boundary between humans and computers, this old paradigm of “computing” has changed drastically, e.g., in human computation humans do all or part of the computing (for machines), in computer-supported cooperative work (CSCW) humans are working together with assistance from computers to conduct cooperative work, in social computing and computer-mediated communication people's social behaviors are intermingled with computer systems so computing happens with humans and computers at the same time while humans are using computers to live their lives, and for cyborgs we are talking about human-robot hybrids or robot-human hybrids where the boundary between humans and machines becomes even more blurred. To some extent we see more and more a hybrid human-machine computing (HHMC) world where both humans and machines are working with and for each other.

The main goals of the workshop include 1) to bring researchers working in different disciplines but with common research interests on HHMC together for exchanging research ideas, and 2) to promote interdisciplinary collaborations and experience sharing between different subjects.

The workshop was also be used as an event to discuss medium- and long-term activities in the UK and internationally on HHMC related research, including the possibility to set up a UK- and/or a European-wide research network funded by UK and/or EU funders. The organizers are considering continuing the workshop in future years as a pan-Europe or an international event.

Event Themes (Programme)

At the workshop participants presented their research work and ideas as oral presentations and posters. To encourage participations, the workshop called for extended abstracts rather than full papers, and there was a light-weighted peer review process conducted by the technical program committee to ensure quality of presented work while encouraging less mature work to be discussed among participants. Different types of work were presented: original research, work in progress, research projects and networks, etc. Some work already published elsewhere will also be presented.

All oral presentations were grouped into the following 4 themes and 6 sessions:

1. Human Computation & Crowdsourcing (1 session): work related to the narrow sense of human computation (humans help machines to do things the latter cannot do well/better alone) especially crowdsourcing based methods
2. HHMC Meets Social Sciences (2 sessions): work lying on the boundary between hybrid human-machine computing as a technical concept and social sciences
3. HHMC Meets Cyber Security (1 session): cyber security related work where some part of the main approach is based on or has a close link to the technical concept of hybrid human-machine computing
4. HHMC and Beyond (2 sessions): work focusing on technical solutions around hybrid human-machine computing

In total, 15 long talks (20 mins) and 14 short talks (5-10 mins) were presented at the workshop. Some speakers also displayed their posters at the event to provide more exchanges with other participants.

The workshop also included three invited keynote talks given by renowned UK and international researchers working on different topics of HHMC:

- Password Generation, an Example of Human Computation (Prof Manuel Blum): this talks links the first theme on human computation and the third one on cyber security.
- Simulating Societies – The Challenges and Benefits of Modelling Social Processes (Prof Nigel Gilbert): this talks is largely in the scope of the second theme on social sciences, but with a close link to the last theme “HHMC and Beyond” as many methods of social simulations can benefit from an HHMC approach.
- Alan Turing and the Other Theory of Computation (Prof Lenore Blum): this talks fits more into the last theme “HHMC and Beyond” and points to the definition of computing or computation as a technical concept.

The workshop was concluded by a panel discussion with 5 researchers (Lora Aroyo, Jon Machtynger, Klaus Moessner, Anna Cinzia Squicciarini, Alireza Tamaddon-Nezhad) and the workshop general chair Shujun Li, which focused on how to develop the HHMC research community further after the workshop ended.

More details of the workshop’s programme with downloading links of some presentations can be found at <http://hhmc2017.commando-humans.net/program.php>.

Next Steps (Outcomes)

The workshop did not publish a proceedings before the event. A post-workshop journal special issue is being planned for selected work presented at the workshop. The post-workshop special issue will be published at the open access journal of *Human Computation* (<http://hcjournal.org/>). The general chair is also considering selecting some other work for potential contributions to a book the IFIP WG 13.7 Human-Computer Interaction & Visualization is planning.

The conversions among participants and the panel discussion led to the consensus that there is a research community on the topic but there is a lack of scientific events allowing this community to meet up. The AAAI Conference on Human Computation (HCOMP) held annually in North America is probably the most established event for this community, but its scope is narrower than HHMC and it is not well attended by people out of North America. There are some other events in different research communities especially on crowdsourcing (e.g. in multimedia, WWW, HCI, computational social sciences, etc.), but they only cover a subset of researchers who are interested in HHMC. In the UK some researchers are applying to EPSRC for a research network+ for a related concept called Human-Like Computing (HLC), but it does not cover the “hybrid” aspect of the HHMC concept. The workshop received broader interests from a number of professional bodies (IEEE, ACM, IFIP, Citizen Science Association, Cognitive Science Society, and AAAI), which suggested that none of the single body can sufficiently cover the emerging highly interdisciplinary topic.

Based on the discussions, a number of actions were agreed for the workshop’s organisers to follow up:

- Setting up a mailing list for people who are interested in HHMC (not limited to participants of the workshop)
- Exploring the possibility to resume the event in 2018 probably at a European city
- Liaising with UK funders for the possibility to set up a new research network(+) on HHMC

- Exploring the possibility to set up a pan-European research network (probably funded as a COST action or an H2020 project)
- Producing a public facing report for research funders and related research communities to advocate HHMC as a new and emerging interdisciplinary subject

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Technical Co-Sponsors

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Other Helpers

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Photos

Some selected photos from the workshop can be found at <http://hhmc2017.commando-humans.net/photo.php>.