

# CoinCIDE – Cognitive Processes and HCI Design

Special Session along with the Tenth International Conference on Advances in Computer-Human Interactions  
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## I. INTRODUCTION

One major feature of computer science is its inherent service characteristics. The invention and development of computers as well as the development of the research field were heavily coupled with emerging demands from application fields or other research areas. There is only a minority of cases, where computer science development was not driven by external factors. Furthermore, these external impulses are and were not only limited to proximal research areas like mathematics, computer sciences, or engineering sciences. In fact, computer science research is driven by nearly all practical questions of the society and coupled with developments in nearly all other research disciplines.

Since computers have conquered such a wide field of applications in the last decades and are inevitably coupled with our day-to-day life, nearly everybody also has to interact with at least one nowadays. Consequently, the research field of human-computer interaction has emerged to a mature science in the last years, going the way from the simple observation of user behavior and subsequent optimization of graphical user interfaces or interaction devices to profound interaction-process analyses and interaction-design studies.

In this line, human-computer interaction not only serves through optimizing processes and interfaces for practical challenges, but it also delivers new challenges and objects of valuable research for other research fields. Hence, the research field is an ideal playground for interdisciplinary user-centered research. In not many other fields, there can be such a strong interrelation between high-performance computing, algorithmic geometry, data analytics, media psychology, and cognitive science. However, incorporating all of these fields at a time in research projects is often not needed and very cumbersome. What is most important and should not be underestimated in the majority of human-computer interaction research is the strong link between interface design and cognitive processes to gain user interfaces that are tailored to the use case and the user group.

## II. SPECIAL SESSION

Taking these considerations in mind, the Tenth International Conference on Advances in Computer-Human Interac-

tions in 2017 featured a special session that specifically invited full papers with novel research contributions but also short papers as work-in-progress reports that particularly highlight this interdisciplinary link. Goal was to promote the whole range of interdisciplinary research of human-computer interaction and cognitive sciences, ranging from the incorporation of cognitive and psychological knowledge into the interface-design process to the research of common HCI challenges with psychological methods. The list of desired topics included:

- human-centered data analytics
- cognition-tailored human-computer interaction
- discussing cognitive aspects of human-computer interaction
- impact of human-computer interfaces on cognition processes
- relating cognitive insights to practical HCI challenges
- qualitative and quantitative evaluation of human-computer interaction approaches

As contributions to the session, three papers were accepted. The contributions reflected the whole range of desired topics, ranging from the fundamental question if eye movements could trigger emotional states of users, over the use of eye-tracking methods to measure the effectiveness of different visualization methods, to the point of a design study for developing a user-centered visual design for a practical use case.

## III. CONCLUSIONS

This special session of ACHI 2017 put a special focus of the interdisciplinary connection of cognitive psychology and HCI design processes. The contributions have shown, that this special link can create additional benefits for various research projects and give valuable insights for both sides, computer science and media psychology. In the near future, much more effort has to be made to foster this connection from both sides and attract cognitive scientists to get involved into HCI projects as well as make computer scientists aware for the additional benefit an interdisciplinary cooperation can bring.