A propos du centre ou de la direction fonctionnelle

The Inria Lille - Nord Europe Research Centre was founded in 2008 and employs a staff of 360, including 300 scientists working in sixteen research teams. Recognised for its outstanding contribution to the socio-economic development of the Hauts-de-France region, the Inria Lille - Nord Europe Research Centre undertakes research in the field of computer science in collaboration with a range of academic, institutional and industrial partners.

The strategy of the Centre is to develop an internationally renowned centre of excellence with a significant impact on the City of Lille and its surrounding area. It works to achieve this by pursuing a range of ambitious research projects in such fields as computer science as the intelligence of data and adaptive software systems. Building on the synergies between research and industry, Inria is a major contributor to skills and technology transfer in the field of computer science.

Contexte et atouts du poste

The selected applicant will join the Lokí research group and work in collaboration with Prof. Géry Casiez and Dr. Sylvain Mailloux. Inria's project is partly connected to the International Association Laboratory Réapp between Lokí and the HCI Lab group from the Cheriton School of Computer science at the University of Waterloo in Canada.

Mission confiée

Context:
We are at the dawn of the next computing paradigm where everywhere will be able to sense human input and augment its appearance with digital information without using screens, smartphones, or special glasses; making user interfaces simply disappear [1,5]. This introduces many problems for users to understand and to enable the discovery of commands [4] and use of diverse interaction techniques; the acquisition of expertise [2] and the balancing of trade-offs between inferential (AI) and explicit (user driven) interactions in aware environments. We argue that interfaces must reappear in an appropriate way to make ubiquitous environments useful and usable. This post-doc tackles these problems, addressing the study of human factors related to ubiquitous and augmented reality environments and the development of new interaction techniques helping to make interfaces reappear; the improvement of transition between novice and expert use and last, the question of delegation in smart interfaces and how to adapt the trade-off between implicit and explicit interaction.

Objectives

The goal of this post-doc is to make interfaces re-appearing in ubiquitous environments, by following the directions detailed hereafter:

State-of-the-art of disappearing interfaces
One premise of ubiquitous computing is that the interface should disappear [5]. In practice, what this means is that, while the user can still interact and control the environment, the environment itself is instrumented in ways that allow it to track and monitor the user; to capture user action, and to infer intended command-invocation targets. A first goal is to establish a state-of-the-art of what has been proposed in the scientific literature and commercial products to support disappearing interfaces. When available the associated design rationales will have to be clarified and it will be necessary to analyze the benefits and drawbacks these design choices introduce.

Designing mechanisms and interaction for novices, experts, and the novice to expert transition
Ubiquitous environments are made of various technologies that can be used to dynamically augment user interactions. The goal is to study how these technologies can be used to increase the system's communicability to assist novice users both for discovering the features available in the system, as well as assisting the user in improving her skill executing tasks with the system. Most notably, augmented reality technology makes it possible to overlay information in context, providing a unique opportunity to make the interface reappear in a way that will depend on interaction context. More precisely, the goal is to study how augmented reality, combined with audio and haptic guidance [1], can be used to help a novice user to discover the features supported by the system, as well as provide contextual feed-forward to assist her while carrying out her task.

Transparency in input and output
One known challenge with intelligent systems is that users need to understand how systems behave, why they make errors, and how to avoid errors. Understanding errors can become particularly challenging when systems are designed to infer actions and behaviors. Ideally, richly interactive environments would be "calm technologies", and interfaces would "vanish from perception" but this goal exist in tension with a need for a user to be able to perceive allowable actions and system state and to formulate plans to act. Specifically, one common model of interaction with interactive systems is Norman's Model of Interaction. In this model, Norman examines interaction from the perspective of a human user, separating interaction into two phases: execution and evaluation. From the perspective of execution, the user has tasks he or she would like to perform. These tasks require an intentional manipulation of the state of the system, formulated as a series of actions on the system. Once performed, the user moves to the evaluation phase: the computer provides feedback to the user which is perceived, interpreted, and then evaluated with respect to the ultimate goal of the user.

References
Principales activités

- Design novel ubiquitous interactive systems that make Interface re-appear in this context
- Implement demonstrators and/or background applications that can be used to test these novel designs
- Design, run and analyze the results of controlled and/or field experiments to assess the benefits of these novel interactive systems
- Write and submit scientific papers to top-tier HCI conferences and journals

Compétences

- A PhD degree in Human-Computer Interaction or similar field
- A solid track record of publications in top-tier HCI venues
- Significant track record of design and implementation of interactive systems and GUIs
- Strong object-oriented programming skills
- Familiar with designing and analyzing evaluations of interactive systems, (knowledge of R and/or Jupyter notebook is appreciated)
- Fluent English level

Avantages

- Subsidized meals
- Partial reimbursement of public transport costs
- Leave: 7 weeks of annual leave + 10 extra days off due to RTT (statutory reduction in working hours) + possibility of exceptional leave (sick children, moving home, etc.)
- Possibility of teleworking (after 6 months of employment) and flexible organization of working hours
- Professional equipment available (videoconferencing, loan of computer equipment, etc.)
- Social, cultural and sports events and activities
- Access to vocational training
- Social security coverage

Rémunération

- Gross monthly salary (before taxes): 2653 €

Attention: Les candidatures doivent être déposées en ligne sur le site Inria. Le traitement des candidatures adressées par d'autres canaux n'est pas garanti.