

# PhD position in HCI

Topic: Towards a better discoverability of interactions in Graphical User Interfaces

**Location:** Lille (France)

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**Application deadline:** 31/05/2020

The Loki research group at Inria (France) is looking for a PhD student starting fall 2020 to work on the design, implementation and evaluation of Discoverable Graphical User Interfaces, funded by the ANR JCJC Discovery Grant. This thesis is also part of an Associated Lab between the Loki research group and the HCI Lab Group of the University of Waterloo (Canada). As such, the selected PhD Candidate will have the opportunity to visit and collaborate with researchers from the HCI Lab Group.

## Context

Guidelines for the design of Interactive Systems almost systematically highlight how important it is for a user to be able to “figure out what actions are possible and where and how to perform them” [1], and how, in general, interactive systems should communicate efficiently and effectively their underlying design intent and interactive principles [2]. Despite these guidelines, modern computing systems in practice suffer from a bad *discoverability*, that is that they do not help users to discover available input mechanisms. This is confirmed by numerous examples of hidden inputs and features that can be found in commercial products [3,4], a trend exacerbated by User-Interfaces that increasingly “disappear” [5].

## Objectives

This PhD will investigate the issue of users' discovery of input mechanisms in gesture-based interactive systems with a focus on the following main objectives:

### *Theoretical contribution*

Little is known regarding which human factors should be leveraged in order to improve the discoverability of input methods. A first goal will therefore be to provide fundamental knowledge on human factors influencing the discoverability of input methods, for instance by producing a comprehensive framework of perceptual factors likely to influence the discovery of input methods in computing systems.

### *Technical contribution*

A second goal will be to propose Graphical User Interface refinements that will foster the discovery of computing system's available features and corresponding input methods. Different types of GUIs can be explored, such as novel type of graphical widgets, reflective interfaces, etc. Similarly, different interaction paradigms, such as touch-based interaction or Augmented Reality settings will be explored.

### *Methodological contribution*

Evaluating the discovery and appropriation of novel interaction techniques remains uncommon and no clear protocols have been proposed in that respect. A third goal will be to establish evaluation methods and tools that can be used to assess the discoverability of input modalities and interaction techniques during laboratory style, online, and “in the wild” experiments.

## Location

The PhD candidate will join the LOKI research group, based in the [Lille - Nord Europe Inria research center](#), located in the Lille area. Lille is at the northern tip of France and its metropolitan area, situated at the crossroads of northern continental Europe, is the 5th biggest in France. During the PhD, the candidate will have the opportunity to visit the HCI Lab Group of the University of Waterloo (Canada).

## The candidate

A successful candidate must hold an MSc in Human-Computer Interaction (or equivalent), and show a great interest in performing high quality research. He or she must demonstrate experience or strong interest in software development. Creativity, independence, team working and communication skills are valuable advantages. A track record of publications in top-tier HCI venues (such as ACM CHI, UIST, CSCW) is expected, as well as a significant track record of design and implementation of interactive systems and GUIs.

## References

- [1]- D. Norman. The design of everyday things: Revised and expanded edition. Constellation, 2013.
- [2]- C. S. De Souza. The semiotic engineering of human-computer interaction. MIT press, 2005.
- [3]- J. Avery and E. Lank. Surveying Expert-Level Gesture Use and Adoption on Multi-Touch Tablets. DIS 2016.
- [4]- N. Pong and S. Malacria. Awareness, Usage and Discovery of Swipe-revealed Hidden Widgets in iOS. ISS 2019.
- [5]- T. Ni and P. Baudisch. Disappearing Mobile Devices. UIST 2019.