

# Invitation à la soutenance publique de thèse

Pour l'obtention du grade de Docteur en Sciences de l'Ingénieur

**Monsieur Iyad KHADDAM**  
Master in Computer Science

**Prism: A Life Cycle to Align User Interface and Software  
Developments based on a Linguistic Perspective**

While Software Engineering (SE) is primarily concerned with developing software products, Human Computer Interaction (HCI) is primarily concerned with the user interface of these products striving for its quality, such as through usability. Therefore, integrating both disciplines is key to develop usable software products. The effort to align activities from both domains started since HCI emerged as a discipline in the early 80s. Yet, such an alignment proved to be a hard goal to reach. Consequently, valuable HCI contributions and models are not considered by the software industry as they could be.

In order to address the aforementioned challenge, this thesis analyzes different approaches to align HCI and SE in order to identify the root cause that is hampering the alignment effort. It follows a Root Cause Analysis methodology that helps, not only to identify the root cause, but also to propose a solution for it. This thesis suggests the linguistic perspective as an alternative to common user interface development which does not foster creating a concrete UI during the early phases (such as analysis), while the linguistic perspective enables this possibility by materializing linguistic levels (i.e., goal, pragmatic, semantic, syntactical, lexical, alphabetical, and physical) that are already analyzed into a partial yet concrete user interface.

This change of perspective implies several changes to other HCI concepts which are discussed in this thesis: how a user interface can be developed from a linguistic perspective. For this purpose, this thesis proposes a linguistic user interface development language (the Prism Programming Language). Moreover, it explores modeling approaches from the linguistic perspective, proposes a linguistic modeling framework and instantiates a graphical user interface linguistic model from it. Furthermore, it develops a user interface development life cycle (The Prism Development Life Cycle) that can be instantiated in different software development life cycles, such as agile methods. The Prism Development Life Cycle allows aligning SE and HCI in the right way that is needed to develop usable software products.

The contributions of this thesis set the bases towards a shift in the user interface paradigm by fostering a different way of thinking. The user interface linguistic paradigm to common user interface paradigm is like object oriented programming to procedural programming.

**Vendredi 18 novembre 2016 à  
16h30**

Auditoire Doyen 22  
Place des Doyens, 1  
1348 Louvain-la-Neuve



## Membres du jury :

Prof. Jean Vanderdonck (UCL), promoteur  
Prof. Christophe De Vleeschouwer (UCL), président  
Prof. Jorge Perez-Medina, (UCL), secrétaire  
Prof. Christophe Kolski (Université de Valenciennes, France)  
Prof. Costin Pribeanu (National Institute for Research and Development in Informatics, Roumanie)  
Prof. Vivian Genaro Motti (George Mason University, USA)