

UNIVERSITY OF MONS

## *Abstract*

Polytechnic Faculty  
Electrical Engineering

Doctor of Philosophy

### **Incorporating Nonverbal Expressions in Human-Agent Interaction Systems: A Focus on Smiles and Laughs**

by Kevin EL HADDAD

This thesis delves into the world of Human-Agent Interactions systems. An agent here serves the role of an intelligent interface between a human and a machine, able to process the surrounding environment and interact with the user in a more human-like way than traditional interface tools. Based on Machine Learning, Signal Processing and Human Behavior Studies, our work is dedicated to incorporating nonverbal expressions, more specifically smiles and laughs, into different building blocs of Human-Agent Interaction systems. Indeed an agent, given the ability of using nonverbal expressions, is expected to provide more seamless interactions and overall therefore better experience. This therefore would contribute to the adoption of this technology within society.