Abstract:
This work defines and characterizes a new class of highly efficient interactive digital systems. Following the idea of cognitive efficiency mechanisms, such as mnemonic devices, it is the goal of such systems to activate hidden user potentials by transforming the original function context into a highly efficient usage context. Since the transformation is implemented digitally within the system they are called Digital Transformatives.
 Initially the new class of Digital Transformatives are schematized. The schema is complemented by a new model of efficiency in human communication, which is developed based on evidence based cognitive research, and validated on practical examples. Based on those findings a concept is deduced, describing the Digital Transformatives working principle. Hereby the importance of cognitive prototypes is highlighted and further investigated.
 The work follows an iterative research methodology, gradually evolving functional characteristics and design guidelines for the development of cognitive prototype oriented systems; also applicable for human machine interaction in general. Moreover, certain cognitive findings are described, providing a selective perspective on psychological aspects, especially involved in communication of enhanced efficiency. Hereby it should be noted that the structure and relations among the presented processes have been deduced by the author from cognition literature, and may vary from typical presentations in this field. This thesis also provides explanations on the efficiency advantages of further implementations, such as Tangible User Interfaces, User Interface Metaphors, Transitional Objects, Persuasive Technologies, and comparative assessment in user evaluations. Finally, the chances of social network analyses for the identification of cognitive shared prototypes are highlighted.