Air traffic control, naval warfare and air combat fighting are examples of domains where highly demanding tasks have to be executed. For an optimal performance on such tasks, humans have to process a great amount of information. This can be impaired due to limitations in human cognition. To aid humans in their task performance and to overcome the aforementioned limitations in human cognition, automated systems can be of help. On the one hand, systems can contribute support in case of performance degradation. On the other hand, automation can be used to provide training for people that have to perform well in demanding circumstances. Human-like agents that serve as opponents or team mates in training simulations need to be based on knowledge of human performance.

This thesis is aimed at an exploration of computational modelling of human-like performance which is applied to (1) the design of agent systems that improve human functioning in demanding circumstances, and (2) human-like virtual agents in simulation-based training. For this purpose, human performance models that represent aspects of human cognition when performing a task have been created and analysed. In specific, the aspects that are represented in this thesis, are a human's functional state, attention and situation awareness, all proven to be important in determining human performance.

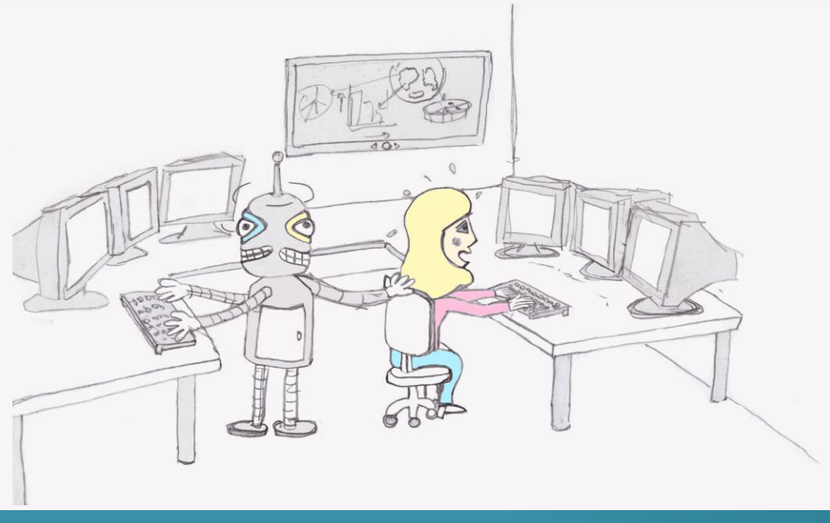
Rianne van Lambalgen

When the Going Gets Tough

Exploring Agent-based Models of Human Performance under Demanding Conditions

Faculteit der Exacte Wetenschappen, Vrije Universiteit Amsterdam
SIKS Dissertation Series: No. 2012-07

When the Going Gets Tough



Rianne van Lambalgen