Simulated environments in combination with game technology have opened up a whole new world of training opportunities. Nowadays, everybody can practice how to ski or play in a band, even without ever having to touch snow or a real instrument. Simulated environments have also greatly enhanced the possibility to train tasks that are too expensive or dangerous to practice in the real world. To ensure a valuable learning experience, it is required that an instructor provides feedback to the trainee, and that the behavior of other role players (like team members, or the enemy) is realistic. Normally humans are used to ensure realistic behavior. But would it not be great if virtual humans could play these roles? That way training would become less expensive and more available, and it would be just as effective.

In this dissertation we investigate the possibility to represent human behavior and to provide feedback to trainees by means of models of human cognition. The presented research into cognitive models for training simulations contributes to a future where everybody can train anytime, anywhere.