Integrating Cognitive Architectures into Virtual Character Design

Part of the Advances in Computational Intelligence and Robotics Book Series

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Description:

Cognitive architectures represent an umbrella term to describe ways in which the flow of thought can be engineered towards cerebral and behavioral outcomes. Cognitive Architectures are meant to provide top-down guidance, a knowledge base, interactive heuristics and concrete or fuzzy policies for which the virtual character can utilize for intelligent interaction with his/her/its situated virtual environment.

Integrating Cognitive Architectures into Virtual Character Design presents emerging research on virtual character artificial intelligence systems and procedures and the integration of cognitive architectures. Emphasizes innovative methodologies for intelligent virtual character integration and design.

Readers:

This publication is an ideal reference source for graduate-level students, researchers, and professionals in the fields of artificial intelligence, gaming, and computer science.
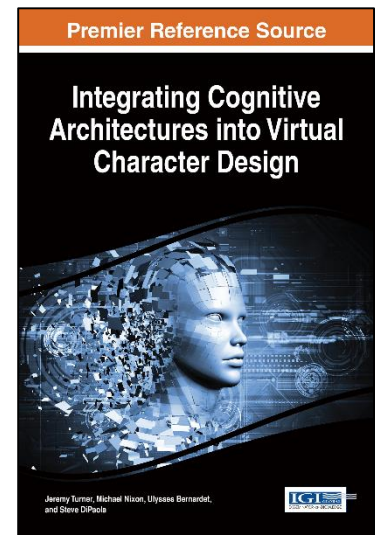
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Topics Covered:

- Artificial General Intelligence (AGI)
- Cognitive Models
- Gaming
- Humanoids
- Logic Structures
- Virtual Agents
- Virtual Worlds

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Jeremy Owen Turner (b. 1974, Victoria, B.C., Canada) is currently a PhD Candidate at Simon Fraser University's School of Interactive Arts and Technology (Vancouver, Canada). Turner is also a sessional Professor at Simon Fraser University's Cognitive Science program. Turner's current research focus is on the subjects of: Artificial General Intelligence (AGI), cognitive science (cognitive architectures) and virtual character design. Since 1996, Turner has also developed an international portfolio as a performance artist, music composer, media-arts historian and art-critic within virtual worlds and video games. Turner's academic history includes an MA about avatar-design in Second Life and an interdisciplinary BA that focused on both Art-History and Music Composition. Turner's current PhD research explores developing cognitive architectural heuristics for virtual agents (automated characters/NPCs) in virtual worlds and video games.

Michael Nixon is a PhD candidate at the School of Interactive Arts & Technology at Simon Fraser University. He researches how to make virtual characters in digital environments more believable through the use of better cognitive models and non-verbal behavior in social contexts. His dissertation research focuses on the use of social signals as cues in the creation of unique identities for believable characters. Michael's M.Sc. thesis describes an investigation into the suitability of Delsarte's system of movement as a framework for the animation of believable characters.

Ulysses Bernardet is currently a postdoctoral fellow at the School of Interactive Arts and Technology of the Simon Fraser University, Vancouver, Canada. He holds a doctorate in psychology from the University of Zurich, and has a background in psychology, computer science and neurobiology. He is the main author of the large-scale neural systems simulator iqr, has developed models of insect cognition, and conceptualized and realized a number of complex, real-time interactive systems. Ulysses' research follows an interdisciplinary approach that brings together psychological and neurobiological models of behavior regulation, motivation, and emotion with mixed and virtual reality. At the core of his current research activity is the development of models of personality and nonverbal communication. These models are embodied in virtual humans and interact with biological humans in real-time. Ulysses likes to refer to this approach of "understanding humans by building them" as Synthetic Psychology.

Steve DiPaola, is a cognitive based AI computer scientist and former director of the Cognitive Science Program at Simon Fraser University. DiPaola also leads the iVizLab (ivizlab.sfu.ca), a research lab that strives to make computational systems bend more to the human experience by incorporating biological, cognitive and behavior knowledge models. Much of the lab's work is creating computation models of very human ideals such as expression, emotion, behavior and creativity. He is most known for his AI based computational creativity (darwinsgaze.com) and 3D facial expression systems. He came to SFU from Stanford University and before that NYIT Computer Graphics Lab, an early pioneering lab in high- end graphics techniques. He has held leadership positions at Electronic Arts, Saatchi Innovation and consulted for HP, Macromedia and the Institute for the Future. His computer based art has been exhibited internationally including the AIR and Tibor de Nagy galleries in NYC, Tenderpixel Gallery in London and Cambridge University's Kings Art Centre. The work has also been exhibited in major museums, including the Whitney Museum, the MIT Museum, and the Smithsonian.