

Cognitive Agents For Virtual Environments First International Workshop Cave 2012 Held At Aamas 2012 Valencia Spain June 4 2012 Revised Selected Papers Lecture Notes In Computer Science

Advances in modern sciences occur thanks to within-fields discoveries as well as confrontation of concepts and methods from separated, sometimes distant, domains of knowledge. For instance, the fields of psychology and psychopathology benefited from accumulated contributions from cognitive neurosciences, which, in turn, received insights from molecular chemistry, cellular biology, physics (neuroimaging), statistics and computer sciences (data processing), etc. From the results of these researches, one can argue that among the numerous cognitive phenomena supposedly involved in the emergence of human intelligence and organized behavior, some of them are specific to the social nature of our phylogenetic order. Scientific reductionism allowed to divide the social cognitive system into several components, i.e. emotion processing and regulation, mental state inference (theory of mind), agency, etc. New paradigms were progressively designed to investigate these processes within highly-controlled laboratory settings. Moreover, the related constructs were successful at better understanding psychopathological conditions such as autism and schizophrenia, with partial relationships with illness outcomes. Here, we would like to outline the parallel development of concepts in social neurosciences and in other domains such as computer science, affective computing, virtual reality development, and even hardware technologies. While several researchers in neurosciences pointed out the necessity to consider naturalistic social cognition (Zaki and Ochsner, *Ann N Y Acad Sci* 1167, 16-30, 2009), the second person perspective (Schilbach et al., *Behav Brain Sci* 36(4), 393-414, 2013) and reciprocity (de Bruin et al., *Front Hum Neurosci* 6, 151, 2012), both computer and software developments allowed more and more realistic real-time models of our environment and of virtual humans capable of some interaction with users. As noted at the very beginning of this editorial, a new convergence between scientific disciplines might occur from which it is tricky to predict the outcomes in terms of new concepts, methods and uses. Although this convergence is motivated by the intuition that it fits well ongoing societal changes (increasing social demands on computer technologies, augmenting funding), it comes with several difficulties for which the current *Frontiers in* topic strives to bring some positive answers, and to provide both theoretical arguments and experimental examples. The first issue is about concepts and vocabulary as the contributions described in the following are authored by neuroscientists, computer scientists, psychopathologists, etc. A special attention was given during the reviewing process to stay as close as possible to the publication standards in psychological and health sciences, and to avoid purely technical descriptions. The second problem concerns methods: more complex computerized interaction models result in unpredictable and poorly controlled experiments. In other words, the assets of naturalistic paradigms may be alleviated by the difficulty to match results between subjects, populations, conditions. Of course, this practical question is extremely important for investigating pathologies that are associated with profoundly divergent behavioral patterns. Some of the contributions of this topic provide description of strategies that allowed to solve these difficulties, at least partially. The last issue is about heterogeneity of the objectives of the researches presented here. While selection criteria focused on the use of innovative technologies to assess or improve social cognition, the fields of application of this approach were quite unexpected. In an attempt to organize the contributions, three directions of research can be identified: 1) how innovation in methods might improve understanding and assessment of social cognition disorders or pathology? 2) within the framework of cognitive behavioral psychotherapies (CBT), how should we consider the use of virtual reality or augmented reality? 3) which are the benefits of these techniques for investigating severe mental disorders (schizophrenia or autism) and performing cognitive training? The first challenging question is insightfully raised in the contribution of Timmermans and Schilbach (2014) giving orientations for investigating alterations of social interaction in psychiatric disorders by the use of dual interactive eye tracking with virtual anthropomorphic avatars. Joyal, Jacob and collaborators (2014) bring concurrent and construct validities of a newly developed set of virtual faces expressing six fundamental emotions. The relevance of virtual reality was exemplified with two contributions focusing on anxiety related phenomena. Jackson et al. (2015) describe a new environment allowing to investigate empathy for dynamic FACS-coded facial expressions including pain. Based on a systematic investigation of the impact of social stimuli modalities (visual, auditory), Ruch and collaborators are able to characterize the specificity of the interpretation of laughter in people with gelotophobia (2014). On the issue of social anxiety, Aymerich-Franch et al. (2014) presented two studies in which public speaking anxiety has been correlated with avatars' similarity of participants' self-representations. The second issue focuses on how advances in virtual reality may benefit to cognitive and behavioral therapies in psychiatry. These interventions share a common framework that articulates thoughts, feelings or emotions and behaviors and proposes gradual modification of each of these levels thanks to thought and schema analysis, stress reduction procedures, etc. They were observed to be somehow useful for the treatment of depression, stress disorders, phobias, and are gaining some authority in personality disorders and addictions. The main asset of new technologies is the possibility to control the characteristics of symptom-eliciting stimuli/situations, and more precisely the degree to which immersion is enforced. For example, Baus and Bouchard (2014) provide a review on the extension of virtual reality exposure-based therapy toward recently described augmented reality exposure-based therapy in individuals with phobias. Concerning substance dependence disorders, Hone-Blanchet et collaborators (2014) present another review on how virtual reality can be an asset for both therapy and craving assessment stressing out the possibilities to simulate social interactions associated with drug seeking behaviors and even peers' pressure to consume. The last issue this *Frontiers* topic deals with encompasses the questions raised by social cognitive training or remediation in severe and chronic mental disorders (autistic disorders, schizophrenia). Here,

therapies are based on drill and practice or strategy shaping procedures, and, most of the time, share an errorless learning of repeated cognitive challenges. Computerized methods were early proposed for that they do, effortlessly and with limited costs, repetitive stimulations. While, repetition was incompatible with realism in the social cognitive domain, recent advances provide both immersion and full control over stimuli. Georgescu and al. (2014) exhaustively reviews the use of virtual characters to assess and train non-verbal communication in high-functioning autism (HFA). Grynszpan and Nadel (2015) present an original eye-tracking method to reveal the link between gaze patterns and pragmatic abilities again in HFA. About schizophrenia, Oker and collaborators (2015) discuss and report some insights on how an affective and reactive virtual agents might be useful to assess and remediate several defects of social cognitive disorders. About assessment within virtual avatars on schizophrenia, Park et al., (2014) focused on effect of perceived intimacy on social decision making with schizophrenia patients. Regarding schizophrenia remediation, Peyroux and Franck (2014) presented a new method named RC2S which is a cognitive remediation program to improve social cognition in schizophrenia and related disorders. To conclude briefly, while it is largely acknowledged that social interaction can be studied as a topic of its own, all the contributions demonstrate the added value of expressive virtual agents and affective computing techniques for the experimentation. It also appears that the use of virtual reality is at the very beginning of a new scientific endeavor in cognitive sciences and medicine.

This book constitutes the thoroughly refereed post-proceedings of the 13th Agent-Oriented Software Engineering (AOSE) workshop, held at the 11th International Conference on Autonomous Agents and Multiagent Systems, AAMAS 2012, in Valencia, Spain, in June 2012. This volume presents 9 thoroughly revised papers selected from 24 submissions as well as two invited articles by leading researchers in the field. The papers cover a broad range of topics related to software engineering of agent-based systems, with particular attention to the integration of concepts and techniques from multi-agent systems with recent programming languages, platforms, and established software engineering methodologies. Through expanded intelligence, the use of robotics has fundamentally transformed the business industry. Providing successful techniques in robotic design allows for increased autonomous mobility, which leads to a greater productivity and production level. Rapid Automation: Concepts, Methodologies, Tools, and Applications provides innovative insights into the state-of-the-art technologies in the design and development of robotics and their real-world applications in business processes. Highlighting a range of topics such as workflow automation tools, human-computer interaction, and swarm robotics, this multi-volume book is ideally designed for computer engineers, business managers, robotic developers, business and IT professionals, academicians, and researchers.

As technology continues to become more sophisticated, a computer's ability to understand, interpret, and manipulate natural language is also accelerating. Persistent research in the field of natural language processing enables an understanding of the world around us, in addition to opportunities for manmade computing to mirror natural language processes that have existed for centuries. Natural Language Processing: Concepts, Methodologies, Tools, and Applications is a vital reference source on the latest concepts, processes, and techniques for communication between computers and humans. Highlighting a range of topics such as machine learning, computational linguistics, and semantic analysis, this multi-volume book is ideally designed for computer engineers, computer and software developers, IT professionals, academicians, researchers, and upper-level students seeking current research on the latest trends in the field of natural language processing.

Vol. includes all papers and posters presented at 2001 Cog Sci Mtg & summaries of symposia & invited addresses. Deals w/ issues of repres & model'g cog processes. Appeals to scholars in subdisciplines that comprise Cog Sci: Psych, Computr Sci, Neuro, Lin

Although virtual worlds continue to grow in popularity, a substantial amount of research is needed to determine best practices in virtual spaces. The artistic community is one field where virtual worlds can be utilized to the greatest effect. New Opportunities for Artistic Practice in Virtual Worlds provides a coherent account of artistic practices in virtual worlds and considers the contribution the Second Life platform has made in a historical, theoretical, and critical context within the fields of art and technology. This volume is intended for both artists and scholars in the areas of digital art, art and technology, media arts history, virtual worlds, and games studies, as well as a broader academic audience who are interested in the philosophical implications of virtual spaces.

This book constitutes the refereed proceedings of the 15th Conference on Advances in Autonomous Robotics, TAROS 2014, held in Birmingham, UK, in September 2014. The 23 revised full papers presented together with 9 extended abstracts were carefully reviewed and selected from 48 submissions. The overall program covers various aspects of robotics, including navigation, planning, sensing and perception, flying and swarm robots, ethics, humanoid robotics, human-robot interaction, and social robotics.

Virtual Reality is not real life. Instead it is life-like creations using computer-generated scenarios. Human behavior is replicated in virtual scenarios, where every detail is controlled by computers, and in situations that can be repeated under the same conditions. Based on technology and design, the user can experience presence. In the virtual world, users are embodied in avatars that represent them and are the means to interact with the virtual environment. Avatars are graphical models that behave on behalf of the human behind them. The user avatar is a proxy that also backs interaction with others, allowing computer-mediated interactions. Analyses directed to understand people's perceptions, personal and social behavior in computer mediated interactions, comprise a multidisciplinary area of study that involves, among others, computer science, psychology and sociology. In the last two decades a number of studies supported by Virtual Reality have been conducted to understand human behavior, in some cases the implications of the technology, or to reproduce artificial human behavior. This book presents a collection of studies from recognized researchers in the area. This book explores the intersection between individual cognitive modeling and modeling of multi-agent interaction.

This book constitutes the proceedings of the 14th German Conference on Multiagent System Technologies, MATES 2016, held in Klagenfurt, Austria, in September 2016. 12 long papers and 5 short papers were carefully reviewed and selected from 28 submissions. MATES 2016 conference talks covered a broad area of topics of interest including MAS engineering and modeling, issues of human-agent interaction, collaboration and coordination, agent-based adaptation and optimization, and applications of MAS, in particular in the smart energy domain. This book constitutes the refereed proceedings of the 6th International Workshop on Intelligent Virtual Agents, IVA 2006. The book presents 24 revised full papers and 11 revised short papers together with 3 invited talks and the abstracts of 19 poster papers. The papers are organized in topical sections on social impact of IVAs, IVAs recognizing human behavior, human interpretation of IVA behavior, embodied conversational agents, characteristics of nonverbal behavior and more.

The two-volume set LNCS 6773-6774 constitutes the refereed proceedings of the International Conference on Virtual and Mixed Reality 2011, held as Part of HCI International 2011, in Orlando, FL, USA, in July 2011, jointly with 10 other conferences addressing the latest research and development efforts and highlighting the human aspects of design and use of computing systems. The 47 revised papers included in the first volume were carefully reviewed and selected from numerous submissions. The papers are organized in the following topical sections: VR in education, training and health; VR for culture and entertainment; virtual humans and avatars; developing virtual and mixed environments.

This exciting collection tours virtual reality in both its current therapeutic forms and its potential to transform a wide range of medical and mental health-related fields. Extensive findings track the contributions of VR devices, systems, and methods to accurate assessment, evidence-based and client-centered treatment methods, and—as described in a stimulating discussion of virtual patient technologies—innovative clinical training. Immersive digital technologies are shown enhancing opportunities for patients to react to situations, therapists to process patients' physiological responses, and scientists to have greater control over test conditions and access to results. Expert coverage details leading-edge applications of VR across a broad spectrum of psychological and neurocognitive conditions, including: Treating anxiety disorders and PTSD. Treating developmental and learning disorders, including Autism Spectrum Disorder, Assessment of and rehabilitation from stroke and traumatic brain injuries. Assessment and treatment of substance abuse. Assessment of deviant sexual interests. Treating obsessive-compulsive and related disorders. Augmenting learning skills for blind persons. Readable and relevant, *Virtual Reality for Psychological and Neurocognitive Interventions* is an essential idea book for neuropsychologists, rehabilitation specialists (including physical, speech, vocational, and occupational therapists), and neurologists. Researchers across the behavioral and social sciences will find it a roadmap toward new and emerging areas of study.

This book offers the exchange of ideas between scientists and technicians from both the academic and industrial sector which is essential to facilitate the development of systems that can meet the ever-increasing demands of today's society. The 18th International Symposium on Distributed Computing and Artificial Intelligence 2021 (DCAI 2021) is a forum to present the applications of innovative techniques for studying and solving complex problems in artificial intelligence and computing areas. The present edition brings together past experience, current work, and promising future trends associated with distributed computing, artificial intelligence, and their application in order to provide efficient solutions to real problems. This year's technical program presents both high quality and diversity, with contributions in well-established and evolving areas of research. Specifically, 55 papers were submitted to main track and special sessions, by authors from 24 different countries, representing a truly-wide area network of research activity. The DCAI'21 technical program has selected 21 papers, and, as in past editions, it will be special issues in ranked journals such as *Electronics*, *Sensors*, *Systems*, *Robotics*, *Mathematical Biosciences* and *ADCAIJ*. These special issues cover extended versions of the most highly regarded works. Moreover, DCAI'21 special sessions have been a very useful tool to complement the regular program with new or emerging topics of particular interest to the participating community.

Welcome to the proceedings of the 9th International Conference on Intelligent Virtual Agents, held September 14–16, 2009 in Amsterdam, The Netherlands. Intelligent virtual agents (IVAs) are interactive characters that exhibit human-like qualities and communicate with humans or with each other using natural human modalities such as speech and gesture. They are capable of real-time perception, cognition and action, allowing them to participate in a dynamic physical and social environment. IVA is an interdisciplinary annual conference and the main forum for presenting research on modeling, developing and evaluating IVAs with a focus on communicative abilities and social behavior. The development of IVAs requires expertise in multimodal interaction and several AI fields such as cognitive modeling, planning, vision and natural language processing. Computational models are typically based on experimental studies and theories of human–human and human–robot interaction; conversely, IVA technology may provide interesting lessons for these fields. The realization of engaging IVAs is a challenging task, so reusable modules and tools are of great value. The fields of application range from robot assistants, social simulation and tutoring to games and artistic exploration.

This book constitutes the refereed proceedings of the 11th International Conference on Entertainment Computing, ICEC 2012, held in Bremen, Germany, in September 2012. The 21 full papers, 13 short papers, 16 posters, 8 demos, 4 workshops, 1 tutorial and 3 doctoral consortium submissions presented were carefully reviewed and selected from 115 submissions. The papers are organized in topical sections on story telling; serious games (learning and training); self and identity, interactive performance; mixed reality and 3D worlds; serious games (health and social); player experience; tools and methods; user interface; demonstrations; industry demonstration; harnessing collective intelligence with games; game development and model-driven software development; mobile gaming, mobile life – interweaving the virtual and the real; exploring the challenges of ethics, privacy and trust in serious gaming; open source software for entertainment.

This book constitutes the proceedings of the 13th International Conference on Intelligent Virtual Agents, IVA 2013, held in Edinburgh, UK, in August 2013. There was a total of 94 submissions. The 18 full and 18 short papers presented in this volume were carefully reviewed and selected for inclusion in the book. In addition, the volume lists the 34 posters which were on display during the conference. The papers are organized in topical sections named: cognitive models; applications; dialogue, language, speech; non-verbal behaviour; and social, cultural models and agents.

There are many applications of computer animation and simulation where it is necessary to model virtual crowds of autonomous agents. Some of these applications include site planning, education, entertainment, training, and human factors analysis for building evacuation. Other applications include simulations of scenarios where masses of people gather, flow, and disperse, such as transportation centers, sporting events, and concerts. Most crowd simulations include only basic locomotive behaviors possibly coupled with a few stochastic actions. Our goal in this survey is to establish a baseline of techniques and requirements for simulating large-scale virtual human populations. Sometimes, these populations might be mutually engaged in a common activity such as evacuation from a building or area; other times they may be going about their individual and personal agenda of work, play, leisure, travel, or spectator. Computational methods to model one set of requirements may not mesh well with good approaches to another. By including both crowd and individual goals and constraints into a comprehensive computational model, we expect to simulate the visual texture and contextual behaviors of groups of seemingly sentient beings. Table of Contents: Introduction / Crowd Simulation Methodology Survey / Individual Differences in Crowds / Framework (HiDAC + MACES + CAROSA) / HiDAC: Local Motion / MACES: Wayfinding with Communication and Roles / CAROSA: Functional Crowds / Initializing a Scenario / Evaluating Crowds

A Complete Toolbox of Theories and Techniques The second edition of a bestseller, *Handbook of Virtual Environments: Design, Implementation, and Applications* presents systematic and extensive coverage of the primary areas of research and development within VE

technology. It brings together a comprehensive set of contributed articles that address the principles required to define system requirements and design, build, evaluate, implement, and manage the effective use of VE applications. The contributors provide critical insights and principles associated with their given areas of expertise to provide extensive scope and detail on VE technology and its applications. What's New in the Second Edition: Updated glossary of terms to promote common language throughout the community New chapters on olfactory perception, avatar control, motion sickness, and display design, as well as a whole host of new application areas Updated information to reflect the tremendous progress made over the last decade in applying VE technology to a growing number of domains This second edition includes nine new, as well as forty-one updated chapters that reflect the progress made in basic and applied research related to the creation, application, and evaluation of virtual environments. Contributions from leading researchers and practitioners from multidisciplinary domains provide a wealth of theoretical and practical information, resulting in a complete toolbox of theories and techniques that you can rely on to develop more captivating and effective virtual worlds. The handbook supplies a valuable resource for advancing VE applications as you take them from the laboratory to the real-world lives of people everywhere.

Cognitive Technology: Instruments of Mind Cognitive Technology is the study of the impact of technology on human cognition, the externalization of technology from the human mind, and the pragmatics of tools. It promotes the view that human beings should develop methods to predict, analyse, and optimize aspects of human-tool relationship in a manner that respects human wholeness. In particular the development of new tools such as virtual environments, new computer devices, and software tools has been too little concerned with the impacts these technologies will have on human cognitive and social capacities. Our tools change what we are and how we relate to the world around us. They need to be developed in a manner that both extends human capabilities while ensuring an appropriate cognitive fit between organism and instrument. The principal theme of the CT 2001 conference and volume is declared in its title: Instruments of Mind. Cognitive Technology is concerned with the interaction between two worlds: that of the mind and that of the machine. In science and engineering, this interaction is often explored by posing the question: how can technology be best tailored to human cognition? But as the history of technological developments has consistently shown, cognition is also fashioned by technology. Technologies as diverse as writing, electricity generation, and the silicon chip all illustrate the profound and dynamic impact of technology upon ourselves and our conceptions of the world. Cognitive Agents for Virtual Environments First International Workshop, CAVE 2012, Held at AAMAS 2012, Valencia, Spain, June 4, 2012, Revised Selected Papers Springer

This book constitutes the refereed proceedings of the 16th International Conference on Principles and Practice of Multi-Agent Systems, PRIMA 2013, held in Dunedin, New Zealand, in December 2013. The conference was co-located with the 26th Australasian Artificial Intelligence Conference, AI 2013. The 24 revised full papers presented together with 18 short papers and 2 invited papers were carefully reviewed and selected from 81 submissions. The papers are organized in topical sections on foundations of agents and multi-agent systems; agent and multi-agent system architectures; agent-oriented software engineering; agent-based modelling and simulation; cooperation/collaboration, coordination/communication; hybrid technologies, application domains; and applications.

Welcome to the Proceedings of the 8th International Conference on Intelligent Virtual Agents, which was held on September 1–3, 2008 in Tokyo, Japan. Intelligent virtual agents (IVAs) are autonomous, graphically embodied agents in a virtual environment that are able to interact intelligently with human users, other IVAs, and their environment. The IVA conference series is the major annual meeting of the intelligent virtual agents community, attracting interdisciplinary minded researchers and practitioners from embodied cognitive modeling, artificial intelligence, computer graphics, animation, virtual worlds, games, natural language processing, and human-computer interaction. The origin of the IVA conferences dates from a successful workshop on Intelligent Virtual Environments held in Brighton, UK, at the 13th European Conference on Artificial Intelligence (ECAI 2008). This workshop was followed by a second one held in Salford in Manchester, UK in 1999. Subsequent events took place in Madrid, Spain in 2001, Irsee, Germany 2003 and Kos, Greece in 2005. Starting in 2006, IVA moved from being a biennial to an annual event and became a full-fledged international conference, held in Marina del Rey, California, USA in 2006, and Paris, France in 2007. From 2005, IVA also hosted the Gathering of Animated Lifelike Agents (GALA), an annual festival to showcase the latest animated lifelike agents created by university students and academic or industrial research groups. IVA 2008 was the first time that IVA was organized in Asia and we are happy to report that a large number of papers were submitted. IVA 2008 received 99 submissions from Europe, the Americas, and Asia.

In the twenty-first century, learning and the definition of education is changing. New digital, online, and social tools have the ability to transform the classroom and engage learners like never before. In the midst of this technological revolution, it is crucial for educators and administrators to be able to gauge the impact of digital tools on learners in a variety of settings. The Handbook of Research on Positive Scholarship for Global K-20 Education is a critical scholarly resource that examines the collaboration of education and technology within disciplinary fields. Featuring coverage on a broad range of topics, such as experiential education, improvisational learning, and andragogy, this publication is geared towards academicians, practitioners, and researchers seeking current research on all areas of education and e-learning.

The story is the richest heritage of human civilizations. One can imagine the first stories being told, several thousand centuries ago, by wise old men huddled around campfires. Since this time, the narrative process has been considerably developed and enriched: sounds and music have been added to complement the speech, while scenery and theatrical sets have been created to enhance the story environment. Actors, dancers, and technicians have replaced the lone storyteller. The story is no longer the sole preserve of oral narrative but can be realized in book, theatrical, dance, or movie form. Even the audience can extend up to several million individuals. And yet in its many forms the story lies at the heart of one of the world's most important industries. The advent of the digital era has enhanced and accelerated this evolution: image synthesis, digital special effects, new Human-Computer interfaces, and the Internet allow one not only to realize more sophisticated narrative forms but also to create new concepts such as video gaming and virtual environments. The art of storytelling is becoming ever more complex. Virtual reality offers new tools to capture, and to interactively modify the imaginary environment, in ever more intuitive ways, coupled with a maximum sensory feedback. In fact, virtual reality technologies offer enhanced and exciting production possibilities for the creation and non-linear manipulation in real time, of almost any story form. This has led to the new concept of Virtual Storytelling.

This book consists mainly of revised papers that were presented at the Agents for Educational Games and Simulation (AEGS) workshop held on May 2, 2011, as part of the Autonomous Agents and MultiAgent Systems (AAMAS) conference in Taipei, Taiwan. The 12 full papers presented were carefully reviewed and selected from various submissions. The papers are organized in topical sections on middleware applications, dialogues and learning, adaptation and convergence, and agent applications.

This book constitutes the thoroughly refereed post-conference proceedings of the 11th International Workshops on Coordination, Organizations, Institutions and Norms in Agent Systems, COIN 2015. The workshops were co-located with AAMAS 2015, held in Istanbul, Turkey, in May 2015, and with IJCAI 2015, held in Buenos Aires, Argentina, in July 2015. The 23 full papers were carefully reviewed and selected from 46 initial submissions for inclusion in this volume. The papers cover a wide range of topics from work on formal aspects of normative and team based systems, to software engineering with organizational concepts, to applications of COIN based systems, and to philosophical issues surrounding socio-technical systems. They highlight not only the richness of existing work in the field, but also point out the challenges and exciting research that remains to be done in the area.

Cognitive sciences have been involved under numerous accounts to explain how humans interact with technology, as

well as to design technological instruments tailored to human needs. As technological advancements in fields like wearable and ubiquitous computing, virtual reality, robotics and artificial intelligence are presenting novel modalities for interacting with technology, there are opportunities for deepening, exploring, and even rethinking the theoretical foundations of human technology use. This volume entitled "Cognition and Interaction: From Computers to Smart Objects and Autonomous Agents" is a collection of articles on the impacts that novel 3 September *Frontiers in Psychology* 2019 | Cognition and Interaction interactive technologies are producing on individuals. It puts together 17 works, spanning from research on social cognition in human-robot interaction to studies on neural changes triggered by Internet use, that tackle relevant technological and theoretical issues in human-computer interaction, encouraging us to rethink how we conceptualize technology, its use and development. The volume addresses fundamental issues at different levels. The first part revolves around the biological impacts that technologies are producing on our bodies and brains. The second part focuses on the psychological level, exploring how our psychological characteristics may affect the way we use, understand and perceive technology, as well as how technology is changing our cognition. The third part addresses relevant theoretical problems, presenting reflections that aim to reframe how we conceptualize ourselves, technology and interaction itself. Finally, the last part of the volume pays attention to the factors involved in the design of technological artifacts, providing suggestions on how we can develop novel technologies closer to human needs. Overall, it appears that human-computer interaction will have to face a variety of challenges to account for the rapid changes we are witnessing in the current technology landscape.

This three volume set provides the complete proceedings of the Ninth International Conference on Human-Computer Interaction held August, 2001 in New Orleans. A total of 2,738 individuals from industry, academia, research institutes, and governmental agencies from 37 countries submitted their work for presentation at the conference. The papers address the latest research and application in the human aspects of design and use of computing systems. Those accepted for presentation thoroughly cover the entire field of human-computer interaction, including the cognitive, social, ergonomic, and health aspects of work with computers. The papers also address major advances in knowledge and effective use of computers in a variety of diversified application areas, including offices, financial institutions, manufacturing, electronic publishing, construction, and health care.

Multi-Agent Geo-Simulation (MAGS) is a modelling paradigm which has attracted a growing interest from researchers and practitioners for the study of various phenomena in a variety of domains such as traffic simulation, urban dynamics, environment monitoring, as well as changes of land use and cover, to name a few. These phenomena usually involve a large number of simulated actors (implemented as software agents) evolving in, and interacting with, an explicit spatial environment representation commonly called Virtual Geographic Environment (VGE). Since a geographic environment may be complex and large-scale, the creation of a VGE is difficult and needs large quantities of geometrical data originating from the environment characteristics (terrain elevation, location of objects and agents, etc.) as well as semantic information that qualifies space (building, road, park, etc.). Current MAGS approaches usually consider the environment as a monolithic structure, which considerably reduces the capacity to handle largescale, real world geographic environments as well as agent's spatial reasoning capabilities. Moreover, the problem of path planning in MAGS involving complex and large-scale VGEs has to be solved in real time, often under constraints of limited memory and CPU resources. Available path planners provide agents with obstacle-free paths between two located positions in the VGE, but take into account neither the environment's characteristics (topologic and semantic) nor the agents' types and capabilities. In addition, agents evolving in a VGE lack for mechanisms and tools that allow them to acquire knowledge about their virtual environment in order to make informed decisions. In this thesis, we propose a novel approach to automatically generate a semantically-enriched and geometrically-precise representation of the geographic environment that we call Informed Virtual Geographic Environment (IVGE). Our IVGE model efficiently organizes the geographic features, precisely captures the real world complexity, and reliably represents large-scale geographic environments. We also provide a new hierarchical path planning algorithm which leverages the enriched description of the IVGE in order to support agents' reasoning capabilities while optimising computation costs and taking into account both the virtual environment's characteristics and the agents' types and capabilities. Finally, we propose an environment knowledge management approach to support the agents' spatial decision making process while interacting with the IVGE.

In the 2nd edition, chapters 22-24 have been completely rewritten. They present a declarative outline for programming the semantic and pragmatic interpretation of natural language communication. The presentation is now simpler and more comprehensive. Examples and explanations have been moved from chapters 22-24 to the new Appendix. A schematic summary and a conclusion have been added as well.

This book constitutes the refereed post-proceedings of the First International Workshop on Cognitive Agents for Virtual Environments, CAVE 2012, held at AAMAS 2012, in Valencia, Spain, in June 2012. The 10 full papers presented were thoroughly reviewed and selected from 14 submissions. In addition one invited high quality contribution has been included. The papers are organized in the following topical sections: coupling agents and game engines; using games with agents for education; visualization and simulation; and evaluating games with agents.

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. Emphasizing innovative methodologies for intelligent virtual character integration

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

This book constitutes the refereed proceedings of the three confederated conferences CoopIS 2002, DOA 2002, and ODBASE 2002, held in Irvine, CA, USA, in October/November 2002. The 77 revised full papers and 10 posters presented were carefully reviewed and selected from a total of 291 submissions. The papers are organized in topical sections on interoperability, workflow, mobility, agents, peer-to-peer and ubiquitous, work process, business and transaction, infrastructure, query processing, quality issues, agents and middleware, cooperative systems, ORB enhancements, Web services, distributed object scalability and heterogeneity, dependability and security, reflection and reconfiguration, real-time scheduling, component-based applications, ontology languages, conceptual modeling, ontology management, ontology development and engineering, XML and data integration, and tools for the intelligent Web.

Creating believable virtual humans for use in interactive video games and other computer graphics applications is a serious challenge. Much research has focused on how to create human models that exhibit realistic appearance and movement. This dissertation investigates how to create virtual humans that act like real people. In particular, we develop human agents that make plans, navigate through complex environments, and communicate with one another. Despite their autonomous behavior, our agents can be tightly controlled by content designers who wish to script their virtual world behavior. Many virtual environments, particularly those used in interactive games, have tight restrictions on memory and frame rate, and we show how judicious offline computation can yield significant runtime performance gains. We demonstrate a virtual world with agents that can plan, navigate, and communicate in English.

This volume, containing the proceedings of IVA 2003, held at Kloster Irsee, in Germany, September 15–17, 2003, is testimony to the growing importance of Intelligent Virtual Agents (IVAs) as a research field. We received 67 submissions, nearly twice as many as for IVA 2001, not only from European countries, but from China, Japan, and Korea, and both North and South America. As IVA research develops, a growing number of application areas and platforms are also being researched. Interface agents are used as part of larger applications, often on the Web. Education applications draw on virtual actors and virtual drama, while the advent of 3D mobile computing and the convergence of telephones and PDAs produce geographically-aware guides and mobile entertainment applications. A theme that will be apparent in a number of the papers in this volume is the impact of embodiment on IVA research – a characteristic differentiating it to some extent from the larger field of software agents.

The origin of the Intelligent Virtual Agents conference dates from a successful workshop on Intelligent Virtual Environments held in Brighton at the 13th European Conference on Artificial Intelligence (ECAI'98). This workshop was followed by a second one held in Salford in Manchester in 1999. Subsequent events took place in Madrid, Spain in 2001 and Irsee, Germany in 2003 and attracted participants from both sides of the Atlantic as well as Asia. This volume contains the proceedings of the 5th International Working Conference on Intelligent Virtual Agents, IVA 2005, held on Kos Island, Greece, September 12–14, 2005, which highlighted once again the importance and vigor of the research field. A half-day workshop under the title “Socially Competent IVAs: We are not alone in this (virtual) world!” also took place as part of this event. IVA 2005 received 69 submissions from Europe, North and South America, Africa and Asia. The papers published here are the 26 full papers and 14 short papers presented at the conference, as well as one-page descriptions of the 15 posters and the descriptions of the featured invited talks by Prof. Justine Cassell, of Northwestern University and Prof. Kerstin Dautenhahn, of the University of Hertfordshire. We would like to thank a number of people that have contributed to the success of this conference. First of all, we thank the authors for their high-quality work and their willingness to share their ideas.

Here is the first of a two-volume set (LNCS 8021 and 8022) that constitutes the refereed proceedings of the 5th International Conference on Virtual, Augmented and Mixed Reality, VAMR 2013, held as part of the 15th International Conference on Human-Computer Interaction, HCI 2013, held in Las Vegas, USA in July 2013, jointly with 12 other thematically similar conferences. The total of 1666 papers and 303 posters presented at the HCI 2013 conferences was carefully reviewed and selected from 5210 submissions. These papers address the latest research and development efforts and highlight the human aspects of design and use of computing systems. The papers accepted for presentation thoroughly cover the entire field of human-computer interaction, addressing major advances in knowledge and effective use of computers in a variety of application areas. The total of 88 contributions included in the VAMR proceedings were carefully reviewed and selected for inclusion in this two-volume set. The papers included in this volume are organized in the following topical sections: developing augmented and virtual environments, interaction in augmented and virtual environments, human-robot interaction in virtual environments, and presence and tele-presence; healthcare and medical applications; virtual and augmented environments for learning and education; business, industrial and military applications; culture and entertainment applications.

Across the academy, scholars are debating the question of what bearing scientific inquiry has upon the humanities. The latest addition to the AFI Film Readers series, Cognitive Media Theory takes up this question in the context of film and media studies. This collection of essays by internationally recognized researchers in film and media studies, psychology, and philosophy offers film and media scholars and advanced students an introduction to contemporary cognitive media theory—an approach to the study of diverse media forms and content that draws upon both the methods and explanations of the sciences and the humanities. Exploring topics that range from color perception to the moral appraisal of characters to our interactive engagement with videogames, Cognitive Media Theory showcases the richness and diversity of cognitivist research. This volume will be of interest not only to students and scholars of film and media, but to anyone interested in the possibility of a productive relationship between the sciences and humanities.

Computing systems including hardware, software, communication, and networks are becoming increasingly large and heterogeneous. In short, they have become increasingly complex. Such complexity is getting even more critical with the ubiquitous permeation of embedded devices and other pervasive systems. To cope with the growing and ubiquitous complexity, autonomic computing (AC) focuses on self-manageable computing and communication systems that exhibit self-awareness, self-configuration, self-optimization, self-healing, self-protection and other self-* properties to the maximum extent possible without

human intervention or guidance. Organic computing (OC) additionally addresses adaptability, robustness, and controlled emergence as well as nature-inspired concepts for self-organization. Any autonomic or organic system must be trustworthy to avoid the risk of losing control and retain confidence that the system will not fail. Trust and/or distrust relationships in the Internet and in pervasive infrastructures are key factors to enable dynamic interaction and cooperation of various users, systems, and services. Trusted/ trustworthy computing (TC) aims at making computing and communication systems—as well as services—available, predictable, traceable, controllable, assessable, sustainable, dependable, persistent, security/privacy protectable, etc. A series of grand challenges exists to achieve practical autonomic or organic systems with truly trustworthy services. Started in 2005, ATC conferences have been held at Nagasaki (Japan), Vienna (Austria), Three Gorges (China), Hong Kong (China), Oslo (Norway) and Brisbane (Australia). The 2010 proceedings contain the papers presented at the 7th International Conference on Autonomic and Trusted Computing (ATC 2010), held in Xi'an, China, October 26–29, 2010. This book constitutes the proceedings of the 17th International Conference on Intelligent Virtual Agents, IVA 2017, held in Stockholm, Sweden, in August 2017. The 30 regular papers and 31 demo papers presented in this volume were carefully reviewed and selected from 78 submissions. The annual IVA conference represents the main interdisciplinary scientific forum for presenting research on modeling, developing, and evaluating intelligent virtual agents (IVAs) with a focus on communicative abilities and social behavior.

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