

The Ninth Annual AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE): A Report

Gita Sukthankar, Ian Horswill

■ *The Ninth Annual AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE) was held October 14–18, 2013, at Northeastern University in Boston, Massachusetts. The mission of the AIIDE conference is to provide a forum for researchers and game developers to discuss ways that AI can enhance games and other forms of interactive entertainment. In addition to presentations on adapting standard AI techniques such as search, planning, and machine learning for use within games, key topic areas include creating realistic autonomous characters, interactive narrative, procedural content generation, and integrating AI into game design and production tools.*

After many years of being held at Stanford University, this year's AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE) was hosted by Northeastern University, courtesy of the NEU Game Design Program. One hundred forty-four participants from 11 countries attended AIIDE 2013. The main program included 16 oral paper presentations, 16 posters, and 3 demonstrations, with an acceptance rate of 27 percent for the main research track. Submissions were reviewed by four program committee members using a new strengths/weaknesses rating system designed to select papers with high potential to influence future game developers. In addition to the standard research track, authors had the option to report on commercial game development experiences by submitting abstracts to the Practitioner track. New to 2013, the conference featured a Playable Experiences track for showcasing innovative AI techniques in complete, polished games or artworks. Submissions to this track were reviewed on the basis of an interactive media demonstration and an abstract; creators of accepted playable experiences were invited to participate in a panel on the topic.

One of the highlights of the conference is the invited speaker series. This year AIIDE hosted four invited speakers representing veterans of the computer game industry and



Figure 1. The AIIDE'13 Organizing Committee.

From left to right: Gita Sukthankar, Michael Mateas, Michael Buro, Julian Togelius, Gillian Smith, Adam Smith, Kevin Dill, Ian Horswill.

Photo courtesy Vadim Bulitko and Emilie St. Hilaire.

prominent academic game researchers. The year 2013 also marked the fourth year of the AIIDE StarCraft AI competition. This competition is designed to foster AI research applied to real-time strategy games by evaluating bots competing head to head in a full game of StarCraft: BroodWar.

Program Details

Workshops were held on the two days prior to the start of the main conference, giving attendees a chance to hold in-depth discussions on topics that complement the themes of the main conference program. Short recaps of the workshops were presented during the first day of the main conference. This year the workshops included the First Workshop on AI and Game Aesthetics (1 day), the Second Workshop on AI in the Game Design Process (1 day), the Second International Workshop on Musical Metacreation (2 day), the Sixth Workshop on Intelligent Narrative Technologies (2 day). A separate report on these workshops also appears in this issue of *AI Magazine*.

In total, 53 papers were presented at the four workshops, with a high percentage of the main conference attendees opting to attend the workshops. The overall workshop program was very successful due to the hard work of the chairs and cochairs of all workshops, their respective program committees, and attendees. The organizers of the Workshop on AI and Game Aesthetics hosted an evening event for the whole community (DAGGER: Game Dev and Academic Demo Night). The purpose of this social gathering was to give game developers and academic researchers an opportunity to demonstrate their work and play games together.

The main program started on Wednesday, October 16, 2013, with a fascinating keynote talk by John Abercrombie (Irrational Games) about his work as team lead developing the AI character Elizabeth for *Bioshock Infinite*. His presentation focused on the myriad design decisions required to create a non-

player character (NPC) sidekick that is both interesting and reliable. Through movement, gesture, and utterance, the Elizabeth NPC subtly draws the player's attention to useful clues and helpfully passes items to the player like a real human team member. The talk was followed by paper presentations on the problem of human modeling. Human modeling encompasses a diverse set of issues ranging from recreating aspects of human behavior within a game AI to learning models of player activity from game logs.

The afternoon opened with the second invited talk, which was delivered by Richard Evans (Linden Labs). Evans spoke about his work as cocreator of the Versu interactive storytelling system. The social simulation that powers Versu enables the reader to experience the same story from the perspective of different characters. Characters in Versu are able to reason about social norms and select actions using a formalization of activity in a novel modal logic. This talk unveiled some of the knowledge representation and planning details behind Versu's reusable social practices.

This invited talk was followed by a series of technical paper presentations on social and affective computing in games and shorter spotlight talks to advertise posters. The final event of the day was the award ceremony for the fourth annual StarCraft AI competition and competition summary, presented by David Churchill and Michael Buro (University of Alberta).

A conference reception was held Wednesday night. This year the reception included a soundtrack of computer-generated music that was provided by the organizers of the Workshop on Musical Metacreation. As is traditional at AIIDE, awards were presented for best paper, best student paper, and best program committee member. This year, the best paper award went to Santiago Ontañón (Drexel University) for his work on applying combinatorial multibandit arm techniques to real-time strategy games. The best student paper was awarded to Anto-

nios Liapis (ITU Copenhagen) and his coauthors Georgios N. Yannakakis and Julian Togelius. Mark Riedl (Georgia Tech) received the best program committee member award for his exemplary work in reviewing AIIDE submissions.

Thursday's sessions started with an invited talk by Fox Harrell (MIT). Fox spoke about his research on identity and semiotics in social media. His interactive narrative, *Mimesis*, allows players to experience covert discrimination scenarios in an underwater ecosystem. This research serves as a potent reminder of how small design decisions can either reinforce or mitigate the perception of bias and discrimination within games.

The invited talk was followed by technical presentations on strategic AI. The primary focus of this session was improvements for Monte Carlo tree search (MCTS), including new sampling strategies and ways to integrate MCTS with knowledge-based methods. The talks spanned a variety of games, ranging from card games to *StarCraft*.

The afternoon sessions commenced with Aleissia Laidacker (Ubisoft Montreal) presenting her work on procedural animation for *Assassin's Creed III*. Since *Assassin's Creed III* is a very physical game that includes avatars that can perform parkour movements, creating realistic physical animations is of paramount importance for maintaining the verisimilitude of the experience. Laidacker showed several exciting videos of the ACIII avatar scaling a windmill and running across steep, snowy terrain. The invited talk was followed by paper presentations on the topic of procedural content generation that introduced new techniques for the programmatic generation of game content such as game levels and maps. In the late afternoon, Michael Mateas (UC Santa Cruz) moderated the Playable Experience track panel. The day culminated with an evening reception featuring posters, demos, and industrial exhibitors.

Friday's technical sessions included a talk from the practitioner track, along with research track presentations on systems and evaluation. In some cases, creating an effective evaluation protocol can be the most difficult part of the development process. Presenters spoke of the challenges of evaluating interactive narrative systems, game level generation, and software architectures.

The conference concluded with the second AIIDE Doctoral Consortium (DC), which was free for all attendees. The purpose of the DC is to provide an opportunity for doctoral students to present their research proposals to the community and to receive detailed personal feedback from experienced mentors. To ensure that the students have enough time to benefit from the feedback, this year's DC was specifically targeted for doctoral students in the preproposal phase of their graduate programs. Partial travel funding for participants was provided by a grant from *Artificial Intelligence Journal*.

The DC program accepted 10 students who presented posters and short spotlight talks. In addition to student presentations, the DC also included a panel presentation from researchers who volunteered to speak about their own career trajectories. This year's panelists were: Michael Mateas (University of California, Santa Cruz), Julian Togelius (ITU Copenhagen), and Jichen Zhu (Drexel). An important aspect of the AIIDE mission is educating doctoral students, and the DC was very successful, thanks to the efforts of the DC chairs and the enthusiasm of the participants.

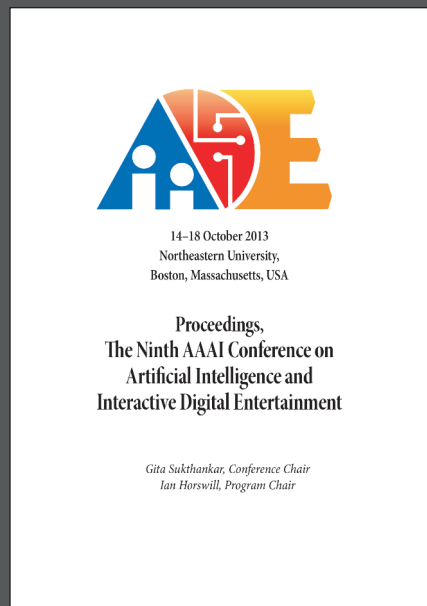
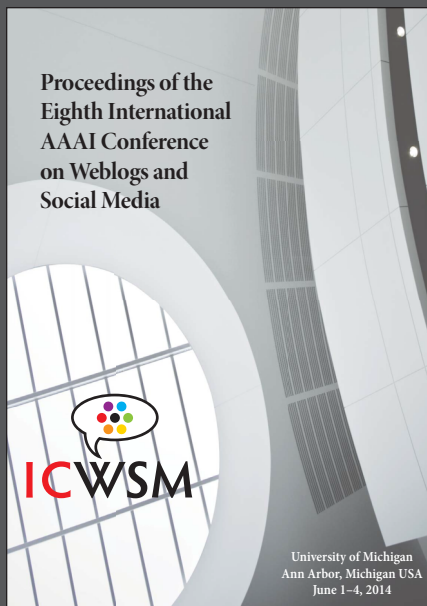
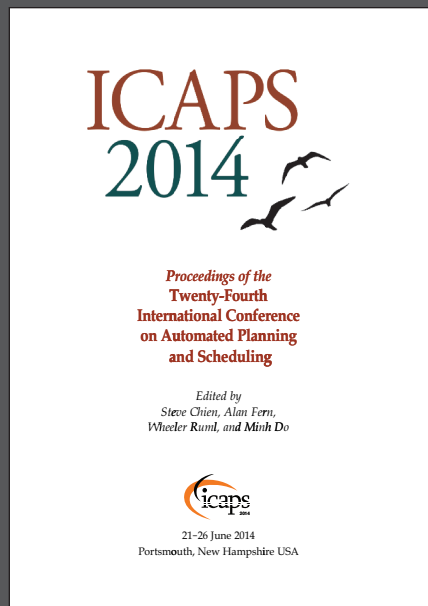
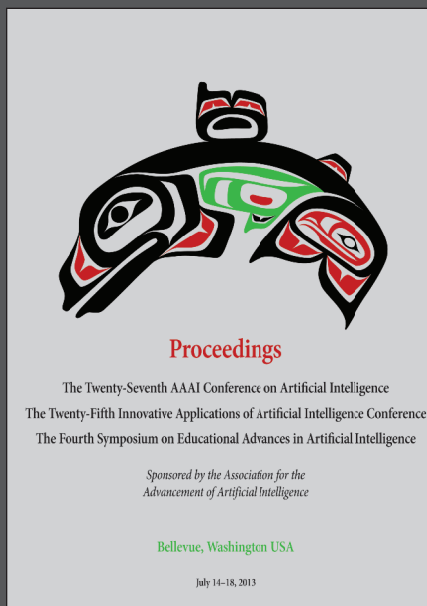
The conference ended late Friday afternoon, sending the attendees their separate ways. Planning for AIIDE 2014 has commenced under the guidance of Ian Horswill (conference chair), Arnav Jhala (program chair), and Kevin Dill (industry relations). Often we think of research advances as being a means of enhancing human productivity, but AIIDE shows the equally important ways that artificial intelligence can bring entertainment, enjoyment, and new experiences into people's lives.

Acknowledgments

A large event such as AIIDE 2013 is a collective effort. Its success would not have been possible without extensive support from Carol Hamilton and Keri Harvey at AAAI. Magy Self El-Nasr (Northeastern University) served as the local chair, and Kevin Dill (Lockheed Martin/Northeastern University) as the sponsorship chair. Northeastern University staff, Greg Houghton and Dara Lynn Pelechatz, assisted with local conference arrangements. The workshop program was organized by the workshop chair, Julian Togelius (ITU Copenhagen). The AIIDE Doctoral Consortium was coorganized by Gillian Smith (Northeastern University) and Adam Smith (University of Washington); the *Artificial Intelligence Journal* provided partial travel funding for the doctoral mentoring participants. Michael Mateas (University of California, Santa Cruz) acted as the chair for the Playable Experiences track. The *StarCraft* AI competition was chaired by Michael Buro and David Churchill (University of Alberta); prizes were sponsored by Blizzard Entertainment, Inc. The conference program was organized by the program chair, Ian Horswill (Northwestern University), and would not have been possible without many hours spent by the program committee of 68 reviewers. The conference was chaired by Gita Sukthankar (University of Central Florida). We appreciate sponsorship by Charles River Analytics (silver), DI-Guy (bronze), and Storybricks.

Gita Sukthankar is an associate professor in the Department of Electrical Engineering and Computer Science at the University of Central Florida, Orlando, Florida, USA.

Ian Horswill is an associate professor of computer science at Northwestern University, Evanston, IL, USA.



New Proceedings from AAAI Press

www.aaai.org/Press/Proceedings