

The Eighth AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment

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■ *The Eighth AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE) was held October 8–12, 2012, at Stanford University in Palo Alto, California. The conference included a research and industry track as well as a demonstration program. The conference featured 16 technical papers, 16 posters, and one demonstration, along with invited speakers, the StarCraft AI Competition, a newly introduced Doctoral Consortium, and five workshops. This report summarizes the activities of the conference.*

The Eighth AAAI Conference on Artificial Intelligence and Interactive Digital Entertainment (AIIDE) was held October 8–12, 2012, at Stanford University in Palo Alto, California. AIIDE is a premier interaction forum for researchers in artificial intelligence and interactive entertainment. The conference, which includes a research and industry track as well as a demonstration program, aims to bring together both academic and industrial communities for the purpose of idea exchange and networking.

The main program featured 16 technical paper presentations, 16 posters, and one demonstration.

One of the highlights of the conference is the invited speaker series. This year AIIDE hosted four invited speakers representing both veterans of the computer game industry, notable figures from the emerging world of entertainment robotics, and prominent academic game researchers. In addition to the invited speaker series, AIIDE held an interactive panel on the future challenges of sports games featuring six veteran game developers from highly successful Electronic Arts sports computer games. The conference also hosted the third annual StarCraft AI Competition, which, once again, was an exciting highlight of the conference.

Program Highlights

AIIDE continued its workshop program, which started in 2011. This year, we expanded the number of workshops to five. Workshops were held on the two days — October 8 and 9 — prior to the start of the conference technical sessions. This year the workshops included the Fifth Workshop on Intelligent Narrative Technologies (held over two days), along with two one-day workshops — the First International Workshop on Musical Metacreation and Artificial Intelligence in Adversarial Real-Time Games — and two half-day workshops — Human Computation in Digital Entertainment and Artificial Intelligence for Serious Games.

All five workshops attracted substantial audiences and led to exciting debates and fruitful discussions on topics that complement and expand upon the themes of the AIIDE conference. In total, an amazing 51 papers, posters, and demos were presented in the five workshops. The overall workshop program was successful due to the hard work of the chairs and cochairs of all workshops, their respective program committees, and attendees.

The main program started on Wednesday, October 10, 2012, with a captivating keynote talk by Dr. Zoran Popovic (University of Washington), the principal investigator on the *Foldit* game, which introduced a brand new method of scientific discovery in which novices can solve problems that advance scientific frontiers. Popovic used his talk to illustrate how game design and data mining can be used to revolutionize game-based learning and education.

The talk was followed up by paper presentations on planning and search in computer games. Pathfinding is one of the most common applications of AI for computer games, which is challenging in game environments with severe CPU and memory limitations. A novel use of path search explored in this year's program is the analysis of game-level designs. Planning can also be used to control nonplayer characters in games. While one most often thinks of controlling adversaries, an emerging topic of research is in the creation of "sidekick" characters for cooperative

games, in which the AI-controlled character must anticipate and plan for player actions.

The afternoon opened with the second invited talk, by Hannes Vilhjálmsson (Reykjavík University), who took us on a journey through his career of research on instilling virtual characters and avatars with social intelligence. His talk featured many interesting videos showing how gestures and movement can facilitate more natural player interactions.

The afternoon talk was followed by a series of technical paper presentations on creating virtual characters and narratives for games. Story is an integral part of interactive entertainment. In computer games, story is a means to motivate and contextualize the action. Stories cannot be told without believable virtual characters capable of plausible behavior and dialogue. Outside of computer games, narrative commentary is also an important means of establishing engagement in televised sports.

Later, Michael Buro and David Churchill (University of Alberta) announced the results of the third annual *StarCraft* AI Competition and handed out the prizes. The videos of AI versus AI competitions enthralled the audience, as did the video replay of the annual man-machine competition, which pits the winner of the AI competition against an accomplished human player. The *StarCraft* AI Competition is an important reminder of the successes — most AI systems this year could beat the best of the previous year — and also the challenges along the road ahead for game AI.

A conference reception was held Wednesday night. As has become tradition at AIIDE, the reception featured an award ceremony for best paper, best student paper, and best program committee members. This year, the best paper award went to Owen Macindoe, Leslie Pack Kaelbling, and Tomas Lozano-Perez (MIT) for their work on reinforcement learning for sidekick companion characters in games. Best student paper was awarded to Alexander Jaffe, Alex Miller, Erik Andersen Yun-En Liu, Anna Karlin, and Zoran Popovic (University of Washington) for their work on evaluating game balance.

Our awards for best program committee member recognize the important role of AIIDE's volunteer reviewers. We chose to present awards to two individuals for their exemplary work in reviewing AIIDE submissions: David Roberts (NCSU) and Adam Smith (UCSC). AIIDE also has a tradition in which the students bring musical instruments to the opening reception. The reception culminated in a sing-along, which created a sense of rapport and camaraderie among conference attendees.

The Thursday sessions started with an invited talk by Rich Hilleman, vice president and chief creative director at Electronic Arts. Hilleman talked about the dramatic changes the commercial game industry is undergoing due to the emergence of mobile platforms and new models of revenue. Data mining of game traces — also called game telemetry — will play an important role in helping commercial game development companies understand their users and deliver new types of entertainment experiences.

The morning talk was followed by technical presentations on the use of evolutionary computing to adapt and create game play content. Procedural content generation, the use of computational procedures to dynamically produce game content, is a rapidly growing area of research. In this session, papers were presented on procedural generation of personalized *Super Mario Bros.* levels, and content for the online social game, *Petalz*.

The afternoon sessions started with the aforementioned sports computer game panel, featuring Daniel White, Scott Rich, Jason Rupert, Fraser Lott, Paul McComas, and Dong Hun Kim (all from Electronic Arts). Topics of discussion ranged from current game AI techniques used in popular sports computer game titles (*Madden NFL* and *NCAA Football*, *NBA*, *NHL*, and *FIFA*) and challenging future areas of research and development.

The panel was followed by paper presentations on computer game authoring and game production. In modern game development, a large amount of human effort is devoted to designing game levels and tuning the game play challenge level to interest,

rather than frustrate, players. In this session, two papers presented techniques for evaluating and balancing game levels. Afterward, a second session on virtual characters and narratives focused on representing emotions of virtual characters in stories and improvising virtual theatrical performances.

The last day started with an invited talk by Marek Michalowski, cofounder of BeatBots, LLC. Michalowski and his company introduced their affordable robotic toy platforms and talked about how, in addition to being entertaining devices, they are being used to facilitate interactions with children with autism.

The technical portion of the conference concluded with paper presentations on player modeling. With four papers, this may have been the most popular topic. Paper presentations covered such topics as structuring of virtual environments to collect player data more efficiently, modeling human cognition when playing tower defense games, and two approaches to dynamic difficulty adjustment.

Doctoral Consortium

For the first time in the conference's history, AIIDE introduced a Doctoral Consortium (DC), which officially kicked off Friday, October 12, 2012. The main objective of the DC was twofold. First, it provided an opportunity for doctoral student participants to present their research proposals to the community and gain valuable constructive feedback. Second, doctoral student participants had the opportunity to discuss and explore their research proposals and career objectives with a panel of established researchers in the field and other AIIDE attendees.

The DC program accepted five students for oral and poster presentations and four students for poster-only presentations based on the strength of short research abstracts, personal statements, and letters of recommendation from their advisors. The research abstracts are published in a separate technical report. Those accepted into the program were assigned a mentor who volunteered time to provide feedback on the quality of research, methodology, presentation, and sched-

ule of completion. Students further in their doctoral process were invited to give 30-minute oral presentations with an extended discussion time. These oral presentations covered a diverse range of topics in the areas of search, modeling, and learning in games. The Doctoral Consortium poster session — which included all DC attendees — was held in conjunction with the main AIIDE poster session and reception.

In addition to student presentations, the DC also hosted a “Career and Funding” panel with contributions from Sven Koenig (University of Southern California), Michael Young (North Carolina State University), and Michael Youngblood (PARC). The main focus of the panel was to discuss issues related to career options in AI — particularly in AI related to digital entertainment, portfolio development, and sources of funding for supporting this research.

Overall, the first DC program was a success as indicated by the large number of AIIDE conference attendees that stayed for the DC program. Furthermore, participants were enthusiastic about the event and their interactions with mentors and other AIIDE attendees. We anticipate an annual continuation of the AIIDE Doctoral Consortium program, to the benefit of the AI and interactive digital entertainment community.

Acknowledgements

A large event such as AIIDE 2012 is a collective effort. Its success would not have been possible without extensive support from AAAI, including Carol Hamilton, Keri Harvey, and Corina Anzaldo-Vaughn. The workshops were coordinated by the workshop chair, Santiago Ontañón (Drexel University). The first annual AIIDE Doctoral Consortium was co-organized by Arnav Jhala (UCSC) and Jichen Zhu (Drexel University). The StarCraft AI Competition was chaired by Michael Buro and David Churchill (University of Alberta) and sponsored by Blizzard Entertainment, Inc. The conference program was organized by the program chair, Gita Sukthankar (University of Central Florida) and would not have been possible without many hours spent by the program committee of 60 reviewers. The conference was chaired by Mark

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Riedl (Georgia Institute of Technology). We appreciate sponsorship by Blizzard Entertainment, Disney Research, Microsoft Studios, and Soar Technologies.

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