

AI and Fun: Research Directions

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The AAAI Workshop on AI and Fun was held on July 11, 2010 during the 25th Annual AAAI Conference in Atlanta, Georgia. The goal of the workshop was to explore the role of artificial intelligence in the creation of fun experiences for humans. The workshop covered a wide set of research challenges in diverse domains including computer games, computer-mediated storytelling, health, training, and education.

Interactive entertainment has become a dominant force in the entertainment sector of the global economy. In 2000, John Laird and Michael van Lent justified interactive entertainment as a domain of study in AI when they posited that computer games could act as testbeds for achieving human-level intelligence in computers, leveraging the fidelity of their simulations of real world dynamics. There is an additional perspective on AI for games: increasing the engagement and enjoyment of the player. This perspective is consistent with the perspective of computer game developers. For them, AI is a tool in the arsenal of the game to be used in lieu of real people when no one is available for a given role. Examples of such roles are:

- Opponents, companions, and NPCs in roles that are not fun to play such as shopkeepers, farmers, and victims
- Cinematographer
- Dungeon master
- Plot writer
- Game designer

As we move down this list, the computational system is charged with progressively more responsibility for providing a user with a fun experience.

But what is fun? We seem to know it when we see it, but fun is also highly subjective. Can we computationally model fun? Can intelligent systems learn and utilize models of fun, player preferences, storytelling, etc., in order to affect human experiences? If so, what would this enable with respect to increased engagement, enjoyment, or new forms of computer-mediated interactive experiences? What are the potential ways forward? To begin to address these questions, we invited 11 research groups to present on their work and to help shed light on the questions from a number of perspectives. We explicitly did not ask for papers, but instead asked that each group present on their perspective on AI approaches to fun, to address the questions above, and to speculate on the future. The presentations roughly clustered into four themes:

1. **Player Modeling and Learning from Humans**, featuring presentations on how to learn models of players, customize game play experience, and make inferences about what humans like to do.
2. **Virtual and Real Humans**, featuring presentations on virtual humans in mixed-reality game environments, modeling human improv actors for the purposes of building better interactive experiences, and agents that express curiosity.
3. **Storytelling and Discourse**, featuring presentations on the question of whether we can

achieve the dream of the Holodeck, how interactive storytelling might reinforce cognitive perception of engagement, and how computational systems can mediate virtual experiences through automated cinematography.

4. **Making Learning AI Fun**, featuring presentations the question of how to engage learners in AI courses with virtual worlds and robotics.

In addition to the four themes, we invited three experts from a disparate set of industries to talk about challenges and opportunities for AI and fun: Miguel Encarnacao, Director of Emerging Technology Innovation at Humana, Inc.; Joe Marks, Vice President of Disney Research; and Bob Sottolare, CTO of the U.S. Army Simulation and Training Technology Center. While it would seem that there is little in common with training warfighters, making people healthy, and entertaining people in theme parks, a consensus emerged that fun is important for motivating people to learn, proactively maintain their health, and create brand loyalty. There was also a call for more research into natural forms of human-computer communication. Most notably, all three domains cited scalability—more people, more personalization, longer experience durations, longitudinal interactions—as a primary bottleneck that required creative automated intelligence.

While we are not ready to formally define the term “fun,” we can—and should—use it as a call to arms for an investigation into core research on intelligent systems that reason about and manage the quality of human experiences both in a variety of domains—including many beyond games, such as education, training, and health—and in a variety of computer-mediated experiences such as storytelling, interactive drama and theatre, serious games, mixed-reality environments and virtual cinematography. While fun can be subjective, progress can be made through study of related, objectively measurable phenomena: engagement, enjoyment, immersion, flow, replayability, motivation, and others yet to be identified. Finally, we note the strong potential for societal impact through the domains that can be affected as well insight into the basic questions of what drives us and how we can computationally model and automatically reason about it.

Mark Riedl, Charles Isbell, Ashwin Ram, and Vadim Bulitko served as co-chairs of this workshop.

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