KI - Künstliche Intelligenz (2020) 34:81–83
https://doi.org/10.1007/s13218-020-00643-0

INTERVIEW

A Games Industry Perspective on Recent Game AI Developments

Interview with Duygu Cakmak, Creative Assembly

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Published online: 7 February 2020

Duygu is a senior AI programmer working at Creative Assembly in the UK. As an AI programmer, she aims to achieve realistic game AI for the Total War series while writing new AI systems, new AI features for the Campaign, and developing visualization tools for AI auto play tests. Her latest work was implementing the new diplomacy AI system for Total War: Three Kingdoms. She holds the "Technical Impact of the Year" award from Women in Games Awards 2019.

KI: Could you please first give us a very rough overview of what kind of games Creative Assembly is working on in general?

Where do I start? We are working on a huge number of projects. Creative Assembly is the oldest and largest UK game developer, so we always have multiple projects on the go. Total War is a series of grand strategy games which have two parts. The first part is a turn-based empire building game, whereas the second part is real-time grand scale battles. There are historical Total War titles, such as Total War: Three Kingdoms, or Total War: Attila. There are also fantasy titles, such as Total War: Warhammer 1 and Total War: Warhammer 2. Creative Assembly also has a console team who developed the BAFTA award-winning Alien: Isolation and Halo Wars 2. They are currently working on a secret project, their own FPS[1,2] (Fig. 1).

KI: And how large are the player bases for your most popular titles approximately? How many games are sold?

Approximately 1.4 million people play Total War each month, and our last 10 standalone titles have sold over 21.4 million units - that doesn't include our DLC[3]!

KI: Looking at the many developments in AI in the last years (especially taking into account many very popular ones as AlphaGo), is any of that important for your company?

Our AI team is always researching and applying new techniques to our games. As an example, we are one of the first game studios who made use of MCTS successfully in game. We are very interested in the current developments in AI research in the last few years and follow the success stories of AI programs such as AlphaGo or Alpha Star with excitement. We look at these advancements closely and consider the possibilities of integrating such systems in to our games in the future.

KI: One of the AI developments that had an influence on game production in the last years is certainly procedural content generation (PCG), does Creative Assembly also use that? If so, how?

As games get ever bigger and need more stuff, using PCG as a force multiplier is important since we just need so much

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[1] FPS means first person shooter.

[2] IP stands for Intellectual Property

[3] DLC means downloadable content.

Fig. 1 Left: Total War: Three Kingdoms grand scale battles, right: Total War: Warhammer 2 turn based campaign

content and it helps with that. We currently use PCG within our art teams. The artists use a procedural pipeline for texture creation, and vegetation, some props and visual effects are procedurally generated offline per map.

KI: How would you rate the overall importance of AI and of research in AI for computer games companies?

Academia and companies have been doing research on behavioral AI in games for more than a decade now. That itself has been massively useful for creating fun and challenging games. Moreover, the AI advancements over the last few years have shown us that companies can use AI techniques not only in-game AI, but also in several other areas of our game development, such as in game engines, in production techniques or even in marketing. There are many interesting AI research areas, such as game analytics that can help companies understand their player-base and serve them better, AI assisted tool development that can aid designers to create a more balanced game, or artists to create a more artistically immersive gaming experience. Therefore, I cannot stress enough the importance of AI and AI research in video game companies in order to increase the quality of current games.

KI: If you think of the evolution of titles as the Total War series that is now almost 20 years old (was published in June 2000), has the role of AI or the importance of AI significantly changed over time?

Much like the rest of the industry, as players' expectations have increased over time, our gameplay and quality of titles have needed to continue to surpass these expectations. Behavioural AI is specifically important in Total War, perhaps more so than other titles, because we lean on it as an adversary to the player—it is more visible and critical than in most multiplayer games where either it isn't needed at all or is seen as a bridge to the PvP[4] later on—for us it is nearly always the principle opponent and needs to be competent, interesting and performant. So, we always push continuously for the AI in the Total War series to be more intelligent, more flexible and more human-like to challenge players.

KI: Do you find it rather easy or rather hard to collaborate with academic research? Could you provide an example for a collaboration?

I think we are one of the lucky game companies, as we believe in, and get the full studio support to make constant improvements and progress on our technologies. For that reason, we have established good relationships with some universities and researchers over the years. We have NDA agreements with them, so we are able to discuss techniques and sensitive data. We also invite researchers to our studio to give talks, share their research and have wider team discussions so we can encourage knowledge sharing both ways. As another example, we are industry project partners with Queen Mary University of London, on the project "Abstract Forward Models for Modern Games", where we help with steering the project into the interests of the game research and industry communities. When we talk about applying techniques from the published literature on game AI, that is a bit of a different story. The majority of the games that research focuses on are very different to ours; as they are usually much smaller and less complicated. This causes scalability problems as even though the techniques introduced are effective in simpler games, they may not be very applicable to complicated games, such as Total War. This puts even more emphasis on the importance of our industry-research collaboration, as I believe if the research bodies have more access to modern, large scale games, their research would be more applicable.

KI: If you would have a wish free for a development in AI that you think would be important for your company or the games industry as a whole, what would that be?

One of the challenges we have for AI in Total War is to assist players whenever there is a collaboration needed. I personally think an adaptive human–AI collaboration system, where AI can understand player's intentions and play with them collaboratively could be an interesting

[4] PvP means player versus player.

advancement, not only in strategy games but for several different genres. Another one could be on dynamic difficulty adjustments in complicated games. There is research done in games with less features or smaller search spaces, such as two player combat games, however, they are not adequate for complex games such as Total War.

KI: Thank you very much for your insights!