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Wevva: Democratising Game Design

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Abstract

Fluidic games blur the line between gameplay and game design, providing playful, non-technical, easy-to-use tools for users to design their own games. We introduce *Wevva*, our first fluidic game for iOS, which allows users to design and share their own games based on novel mechanics, entirely on a mobile device, with no need for programming skills. The development of such software is a significant challenge in user interface design, requiring a new design approach compared to the design of more traditional creative tools, and with much scope for mixed-initiative co-creation and other assistive AI technologies. Our aim with fluidic games is to democratise game design, allowing anyone and everyone to express themselves through the artform of digital games.

Introduction

Video games are arguably the most important artform of the 21st century. However, game development has significant technical barriers to entry, excluding large segments of society from expressing themselves through this medium, especially when compared to other media such as literature, painting or music. We seek to *democratise* the creation of games, building tools to allow anyone and everyone to express themselves through game design.

Many popular games feature user-generated content, allowing players to create and share their own levels and reskinnings of existing games. This increases replay value and adds a social aspect to the game, but also provides players the opportunity to express their creativity. We introduce *fluidic games* to go one step further than user-generated content, allowing the rules and mechanics of the game itself to be modified by the player. By doing so, players can create gameplay experiences that are radically different from those which ship with the fluidic game software.

Fluidic games fit into the larger category of *casual creators* (Compton and Mateas 2015): creative software that has a low barrier to entry and is fun to use. A casual creator is more toy than tool, and should encourage the user to “play” rather than to “use”. One of the design goals for fluidic games is to blur the lines between designing a game and playing a game, and in particular to ensure that the former is just as fun as the latter. This is in contrast to more traditional creative software, which is generally designed to allow professional users to perform a task as efficiently as possible, and enjoyment from using the software is generally not a primary requirement in the design of the software (but is sometimes employed to improve usability (Malone 1982)).

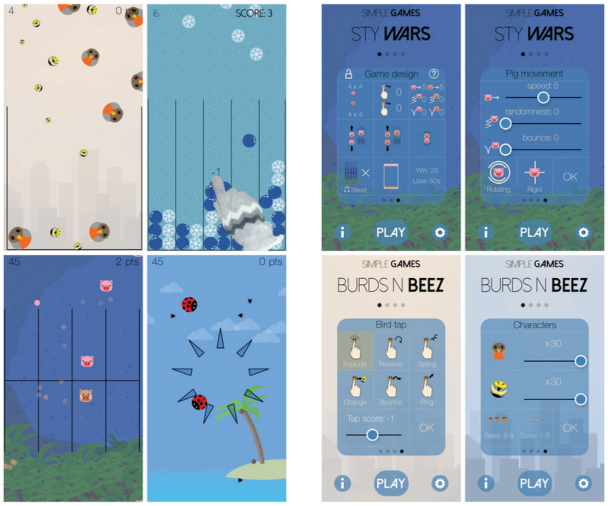
We have developed *Gamika Technology*, a highly configurable game engine for physics-based casual mobile games, as a platform for creating fluidic games. The first commercially released game to be based on this platform will be *Wevva*, which we plan to release on the iOS App Store in summer 2017. A video demonstrating the functionality of Wevva is available at https://youtu.be/5xSufQ8-oRI.

A parameterised game design space

Games in Gamika Technology are based on a 2D physics engine, with game mechanics arising from how the various objects in the simulation react to each other and respond to player input. A game is defined primarily by 284 numerical parameters, controlling the visual appearance, spawning, movement, collisions and control of the objects, as well as the rules for scoring and game end conditions. This parameter space is described in more detail in (Powley et al. 2016a; 2016b). This design space is much more restrictive than that available from a programmable system, and of course there are many types of game that cannot be expressed exactly in this space. Nevertheless we have found it to admit a wide variety of game mechanics and gameplay experiences, including fast reaction-based games, slower-paced puzzle games, and interactive artworks with little or no traditional gameplay. Many genres of 2D arcade-style game can be reproduced reasonably faithfully.

The full 284-dimensional design space can be overwhelming to a novice user, and presenting this many parameters is a significant UI design challenge. Thus we plan to release several apps which expose different subspaces of this larger space, inviting users to explore a smaller (but still very diverse) space in more detail through a simpler interface. Our first such app is Wevva, which presents a subset of the parameters available in Gamika through a menu hierarchy of 3×3 grids. See Figure 1.

By only presenting 9 choices at a time, we avoid overwhelming the user with too many options. The fact that exploration is required to find all available options plays to



(a) (b)

Figure 1: Screenshots of Wevva, showing (a) a selection of games and (b) the design interface.

Wevva's status as a casual creator, as there is playful enjoyment in discovering new functions and experimenting with them to determine what they do.

Interestingly, we have found that schoolchildren with little technical background find Wevva easier to use than undergraduate students with game development experience (Nelson et al. 2017b), possibly because children approach the software with a more playful attitude and fewer preconceived notions of what they want to achieve. This childlike approach requires the user to be more open to the *emergence* of unanticipated game mechanics, allowing the design to evolve rather than sticking rigidly to an initial concept (Colton et al. 2016).

Mixed-initiative co-creation

We are interested in mixed-initiative human/machine co-creativity in games (Smith, Whitehead, and Mateas 2011; Grace and Maher 2014; Yannakakis, Liapis, and Alexopoulos 2014; Liapis, Smith, and Shaker 2016; Nelson et al. 2017a). There is a broad spectrum here between using AI technology to enable human creativity (Shneiderman 2007) and fully autonomous game creation with minimal human input (Cook, Colton, and Gow 2016). Fluidic games are pitched more towards the former than the latter.

We have investigated several ways to enhance fluidic games with AI technology. One example is in using automated playtesting to tune the difficulty of a user-designed game (Powley et al. 2016b). We have also experimenting with using AI playtesters as "assistants", allowing the human player to play alongside them. This can make difficult games more enjoyable for novice players, and can sometimes change the gameplay experience (for example reducing the need for fast reactions, and thus emphasising more contemplative strategic aspects of play). The addition of AI-controlled team-mates is somewhat common in AAA action games, but rather less common in casual mobile games.

In all cases we adopt a "Hollywood AI" design philosophy: the AI components should not only be useful, but should also be entertaining to watch. Foregrounding the AI makes its operation more transparent to the user, and watching the automated tester play the game in real time is much more entertaining than watching a progress bar as the game is tested in the background.

Conclusion

Just as casual games have widened the demographic of people who play games (Juul 2009), casual creator applications have the potential to widen the demographic of people who make games. By taking design cues from the intuitive and playful content creation tools provided by games such as *LittleBigPlanet*, *Super Mario Maker* and *Minecraft*, but extending beyond content creation to whole game creation, we hope to enable anyone with an iPhone or iPad to create and share entirely new games and interactive artworks.

We have used Wevva and other apps based on Gamika Technology to host a number of *rapid game jams*. In a traditional game jam, people who typically have game development experience come together and work intensively on a game for a few days (Kultima 2015; Zook and Riedl 2013). Using fluidic games, we can allow people with no prior game development experience to create games in a space of minutes. The idea of a "lunchtime game jam" is impossible with traditional development software even for professional game developers, but is enabled by fluidic games. These rapid game jams have proven particularly successful with local schoolchildren, with some of the participants discovering interesting new mechanics in the design space that we as the developers of the software had not anticipated (Nelson et al. 2017b).

We believe that Wevva will be the first tool of its kind on the market. Some tools such as Clickteam Fusion (Clickteam 2013) allow users to design games without programming, however these require a desktop or laptop PC. Those tools that run on mobile devices are either limited to level creation or cosmetic reskinning of existing games, or require the user to use some form of programming interface to alter the rules of the game. In this latter category, many tools such as *Scratch* (Resnick et al. 2009; Strawhacker et al. 2015) are vehicles for teaching programming skills. Whilst this is a noble endeavour, it is not one that we necessarily aim to emulate with fluidic games: we see the principles of game design as worth teaching and exploring in their own right, with potential to enrich the creativity of people of all ages and all backgrounds.

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