

GAMIKA: ART BASED GAME DESIGN

The MetaMakers Institute are working on an
app to democratise game design

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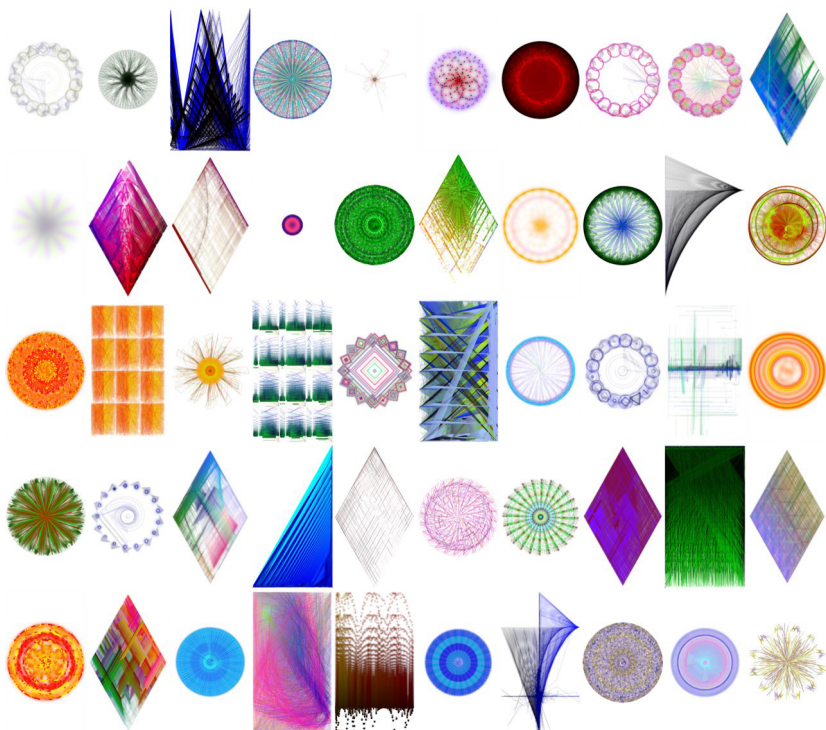
Recent technological advances have enabled large numbers of people to express themselves creatively, who perhaps would not have been able to do so previously. With the proliferation of so-called casual creator software applications (Compton and Mateas, 2015) that allow easy construction and dissemination of artefacts such as musical compositions, stories and visual artworks, we have entered what could be termed an era of mass creation, perhaps starting with the Web 2.0 movement. A particular subset of casual creator apps of interest here are those which operate on a hand-held device, such as a phone or a tablet, i.e., where production takes place on the same device as consumption. Videogame design has been somewhat left behind in this respect. While there are a number of platforms such as *Scratch* (Resnick et. al 2009), *GameMaker: Studio* (yoyogames.com/studio), *Construct 2* (scirra.com) and *Technobabble* (bbc.co.uk/cbbc/games/make-it-technobabble-game-maker), which enable relatively easy game design, there are very few apps for hand-held devices where games can be created in situ on the target device, with *Createrrria 2* (createrrria.com, described below) being a notable exception. This is the context into which we introduce the *Gamika* iPhone app for in-device game creation, which will be released onto the Apple App store in the coming months. Games produced by *Gamika* have at their base pieces of decorative art and user-made drawings.

Aims and Motivations

The overall aim of this project is the democratisation of Game Design, i.e. bringing the ability to create digital games to a much broader section of society. Existing game design environments largely require programming abilities and in the particular case of hand-held gaming, access to a secondary (desktop/laptop) development machine. With the *Gamika* app, we aim to enable people to very quickly produce a digital game directly on their hand-held device. In the next paragraphs we summarize some of the benefits of democratisation of game design. Firstly, many children and indeed teenagers and adults, who are would-be game designers are left behind by steep learning curves and the



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iPhone App screenshot

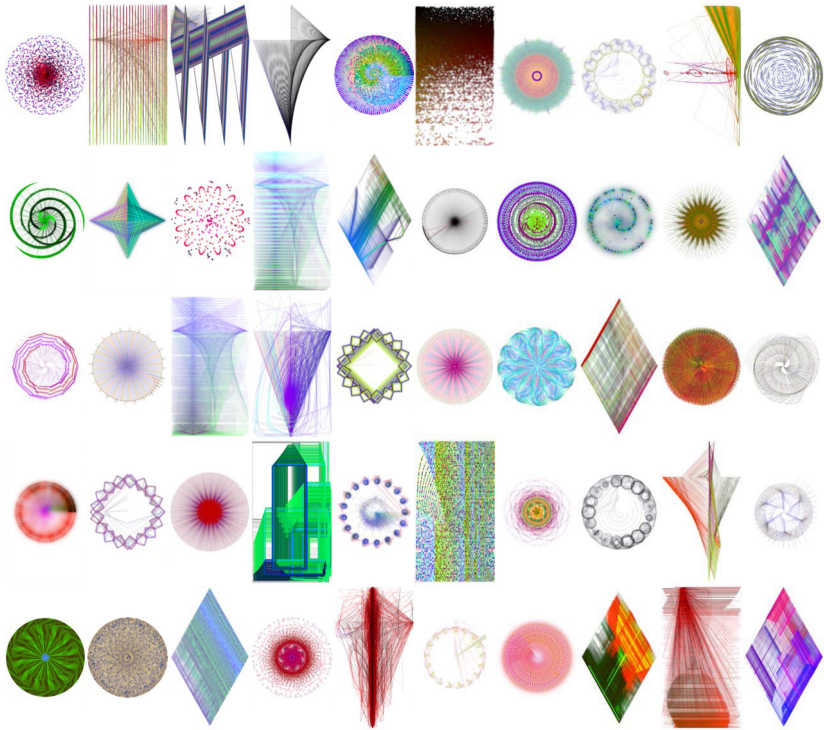


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Gamika 2016
Decorative base images

requirement for programming skills in game development environments, including those specifically made for children, such as *Scratch* (Resnick et. al 2009). With *Gamika*, we aim to minimize learning curves with an intuitive drag-and-drop and drawing interface running on an iPhone. Game making requires many different skills, and while we are working hard in order to minimize the learning curves, and the *Gamika* app erases the barrier of programming entirely, creating a whole new game is still quite challenging. Therefore the possibility of having the software as a co-creator is rather appealing. *Gamika* is the first stage in a project where the software will automatically generate games of its own. We intend to test the hypothesis that people will enjoy watching the software create games. Secondly, an inordinate amount of time is often

spent by independent studios on games that fail commercially, and generally, creative industry best practice is to 'fail fast' (Snoad, 2013), i.e. work out quickly when a game idea has little value and change track before wasting time in development. With the *Gamika* app, for certain game genres, we will enable people to rapidly prototype their ideas in minutes or hours, rather than weeks and months.

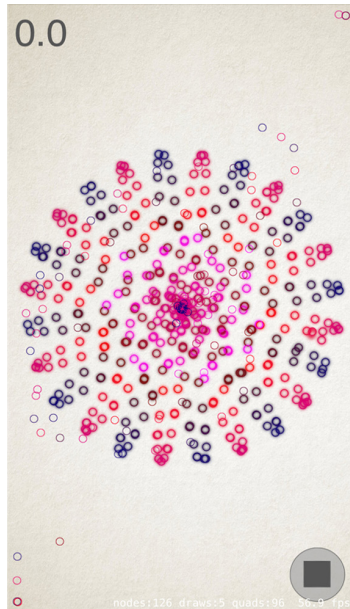
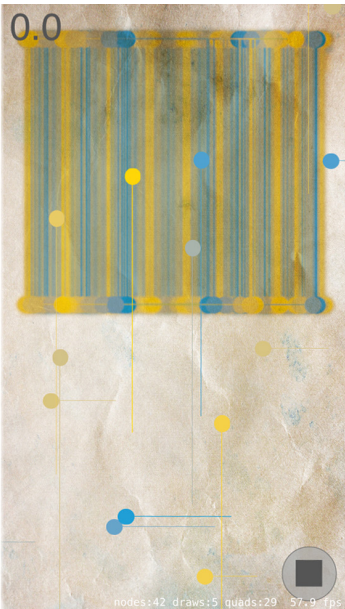
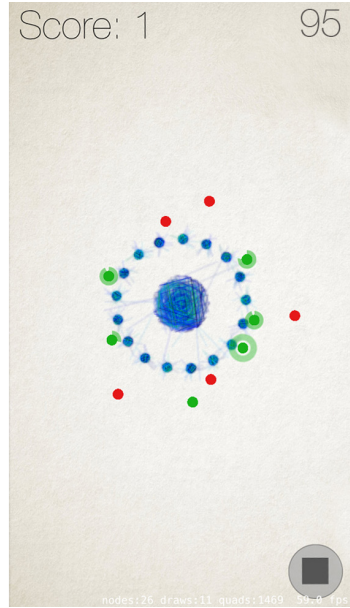
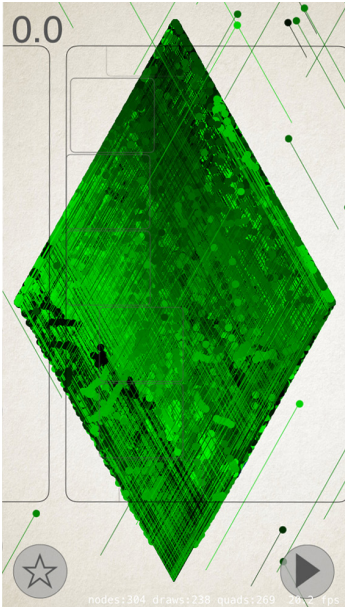
Thirdly, in many contemporary art circles, there is active blurring of boundaries between traditionally different digital art forms such as images, photographs, videos, animations, toys and games. By lowering the barrier to entry to producing a game, we hope that practitioners from all art forms from drawing to dance will be able to express themselves via the *Gamika* app



with interaction, rules and gamification becoming as natural to incorporate in their digital works as line, form and color are with traditional media. To this end, we have taken an art-centric approach with *Gamika*, whereby it is very quick and easy to go from a static decorative art image to an entire digital game with multiple levels, as described below. Finally, we aim for *Gamika* to be a platform for Computational Creativity research, i.e. the sub-field of Artificial Intelligence research where we build software that takes on certain creative responsibilities in art and science projects (Colton and Wiggins, 2012). With parallels to the *ANGELINA* project (Cook et. al, forthcoming), we will experiment with certain approaches to fully automated game design, where *Gamika* provides the underlying game creation functionality.

The Gamika App

A fascinator, to a milliner, is a hat accessory, which is usually moderately aesthetically pleasing, often animated and sometimes interactive. They are designed to attract people’s attention, but not for long. Certain digital artefacts such as images, short videos, interactive toys and casual games share properties of such fascinators, and for the purposes of this paper, we use the term digital fascinator to describe a range of artefacts on hand-held devices from static images to casual games with multiple levels. We specify that each digital fascinator has decorative artwork imagery at its base and that the artefacts are meant to be somewhat disposable. Our use of the digital fascinator terminology is an attempt



to move away from traditional delineations of digital art forms.

ELVIRA is an evolutionary art system for the production of decorative art images (Hull and Colton, 2007), its usage in *The Painting Fool* automated artist (Colton, 2012a) described in (Colton, 2012b). The genome of each image consists of five mathematical functions which determine how the particles are placed and colored initially. The genome also contains information about the amount of blurring and certain transforms to apply to the particles before rendering. We have reimplemented *ELVIRA* as part of *Gamika* in the Swift Programming language for iOS apps, and users have access to 1000 genomes selected by the developers, which can be expanded into images. Each fascinator designed in *Gamika* has at its base one of these decorative images.

Currently, fascinators can be designed with three types of physics objects that interact: friend objects, foe objects and the game controller. Typically friend and foe objects are multiple in number and are shapes, either spawned regularly offscreen or in one go from the particles in the underlying image. The game controller can either be drawn by the user, or can be extracted as the shape of the underlying image. The user can also specify a background image for the fascinator and has control over the lighting conditions. Once the artwork and the spawning of the sprites in the fascinator have been specified, the user can move on to designing movement, interaction and scoring mechanisms, if they so desire.

It has been a challenge to implement a graphical user interface on a phone-sized device, which enables the setting and testing of dozens of parameters for fascinators. One design decision we made was to have the fascinator constantly playing in the background, with the design screen overlaid, and changes made in the design

instantly altering the background fascinator in a live fashion. With alternative setups, we found that disconnects between the design screens and the fascinator being designed were disorientating. We also decided that each new fascinator would be based on a previous one, and we supply numerous preset fascinators in a ‘base camp’ screen. The motivation behind this is for users to avoid blank canvas situations. After choosing a base fascinator, which may have some of the elements required in a new one, the user modifies it until it achieves the desired fascinating effect.

Such ‘modding’ is a well known and popular approach in game design (Sotamaa, 2010). Note that no aspect of fascinator design is hidden, so, in principle, any fascinator can be made from any other, given the correct edits.

Conclusion

We have described the initial stages of the *Gamika* project, where we are building an app which we hope will help to democratise game design and enable more people, and in particular artists, to think in gaming terms when expressing themselves. The benefits of this project are likely to be in enabling rapid prototyping of games, in providing a route for children and gamers in general to explore their interests in game design, and in encouraging the blurring of rigid definitions of digital art forms. It is our hope that *Gamika* will represent a beginning for many artists: a framework with which they can turn their art into an interactive toy for playful contemplation, and/or to experiment with scoring mechanisms and rules on top of their works. In addition to advancing the democratisation of game design, we hope *Gamika* will enable visual artists to begin to appreciate games as “an experience created by rules” (Anthropy, 2012), and play with this idea artfully, appreciating games as important art forms as well as popular entertainments.

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