

The Community Game Development Toolkit

Amelia Roth
aroth@gustavus.edu
Gustavus Adolphus College
Saint Peter, Minnesota, USA

Daniel Lichtman
daniel.lichtman@stockton.edu
Stockton University
Galloway, New Jersey, USA

ABSTRACT

The Community Game Development Toolkit is a set of tools that provide an accessible, intuitive work-flow within the Unity game engine for students, artists, researchers and community members to create their own visually rich, interactive 3D stories and immersive environments. The toolkit is designed to support diverse communities to represent their own traditions, rituals and heritages through interactive, visual storytelling, drawing on community members' own visual assets such as photos, sketches and paintings, without requiring the use of coding or other specialized game-design skills. Projects can be built for desktop, mobile and VR applications. This paper describes the background, implementation and planned future developments of the toolkit, as well the contexts in which it has been used.

CCS CONCEPTS

• **Human-centered computing** → *Virtual reality*; • **Applied computing** → *Fine arts*.

KEYWORDS

prototyping/implementation, manipulation, virtual reality

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1 INTRODUCTION

The Community Game Development Toolkit (CGDT) is a set of tools created by Daniel Lichtman that make it accessible and intuitive for students, artists, researchers and community members to create their own visually rich, interactive 3D environments and story-based games, for VR and screen, without the use of coding or other specialized game-design skills. Developed as a framework within the Unity game design engine, the toolkit is intended to be used by members of diverse communities who may not have experience with computer programming, 3D modeling or other technical game-design skills. CGDT allows users to easily create scenes using their own photos, drawings and other 2D artwork, and create interactivity using built-in game components, without the use of code. CGDT aims to make 3D virtual world-building more

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accessible to a wide range of people. It places a special emphasis on supporting diverse groups of students, artists, researchers and other community members to represent their traditions, rituals and heritages using a quick, intuitive and visual approach to game design.

1.1 Existing Tools for 3D Composition and Game Design

A number of other platforms, apps and frameworks also aim to make game design accessible for screen and VR formats. One such example, designed at Yale University, is the Verb Collective [1], a framework for Unity that encourages users to explore “the material properties of the worlds they create” and the fundamental elements of interactivity by introducing a repertoire of verbs, or actions, that can trigger other actions within a scene. PlayMaker [3], by HutongGames, introduces a high-level visual scripting interface for creating fully developed games in Unity. TiltBrush [2], by Google, allows users to produce graphical 3D paintings in VR space. CGDT is unique among these projects in its focus on intuitive visual scene composition and the development of interactive visual narrative for absolute beginners.

2 BACKGROUND

Lichtman developed the CGDT in the context of teaching game design classes in the New Media Art program at Baruch College, City University of New York. The classes had no coding prerequisites and most students had no previous experience with computer programming. Lichtman developed the toolkit in order to create a framework in which students could immediately begin a process of composing visually-rich, interactive scenes using their own creative assets. Baruch College has an extremely diverse student body. Through a series of assignments, students made use of the toolkit's intuitive, visually-focussed and open-ended work-flow to explore and share representations of their own cultural traditions and heritages that turned out to be surprising and exciting to the classroom community. These creative works may have been more challenging to express using more traditional fine art techniques, especially for the majority of students who were not artists. Working with the CGDT in this context established a focus on developing a tool to make game design and the creation of interactive visual narrative accessible to members of diverse communities who have little background in coding, game development or art.

3 IMPLEMENTATION

CGDT is a downloadable framework of scripts and example assets that the user installs within a standard Unity project, supported by a comprehensive set of documentation and step-by-step tutorials. Toolkit functionality is organized around the use of 2D images,

