

# E-week Engineering Showcase 2025 CPE496/498 Capstone Design Course

# RoboRoller: A Dungeon Master Assistant Tool

Cody Vaughn (CPE), Isaac Payne (CPE), Ryan Fowler (Cyber) Mentor: Doctor Jacob Hauenstein, CS Dept

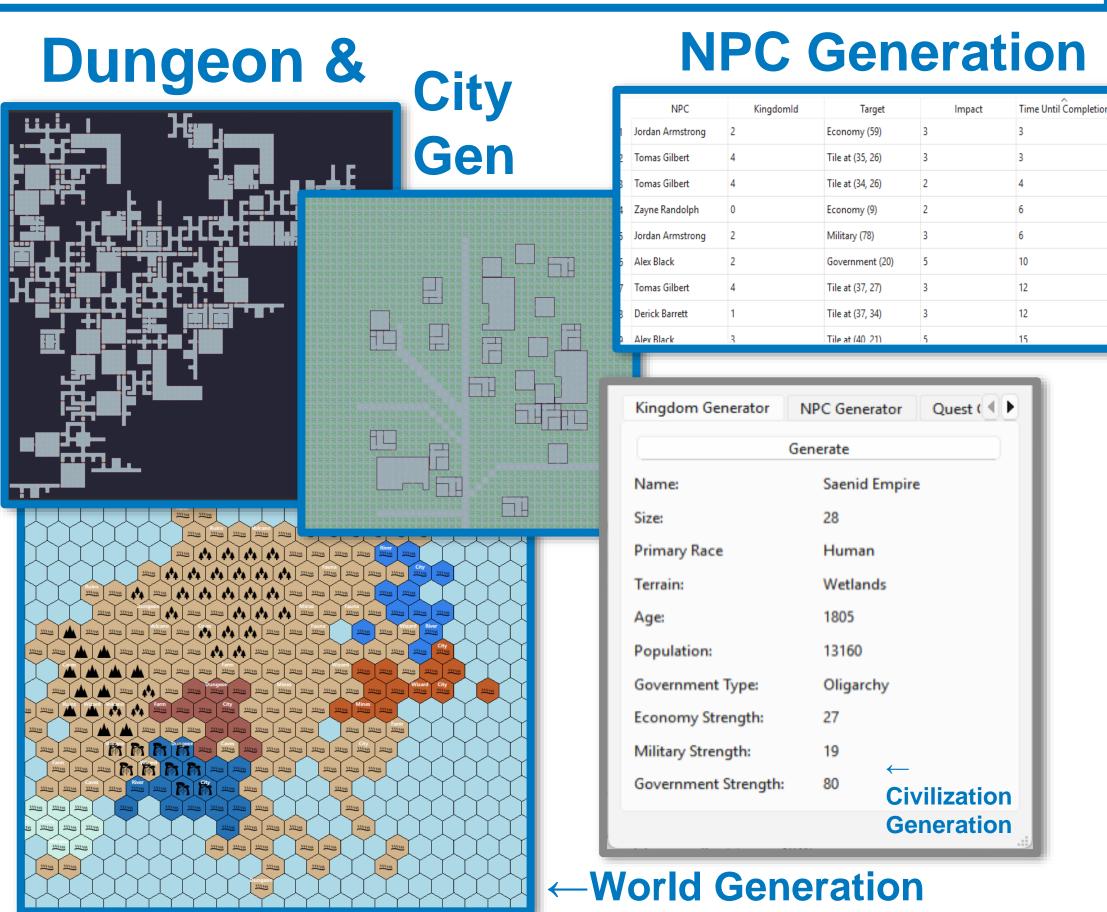
Electrical and Computer Engineering
The University of Alabama in Huntsville

## Overview

Robo Rollers' purpose is to ease and assist the production workload of the Game Master in many TableTop Role-Playing Games (TTRPG).

## **Major Results**

Project design goal met. Major Results as follow, consequence tied world interactions, NPC, Dungeon, City, and World generation into a single tool, additionally providing a time advancing functionality for the set world over time through quest generation and subsequent results.



ENGR	Market	Deceriation	Varification
Req. #	Req. #	Description	Verification
E1	M1	Robo Roller must support maximum grid size for world generation <= 100 x 100 hexagon titles.	Generate a world of size >100x100.
E4	M2, M4	Robo Roller world generation must support creation of minimum 10 civilizations concurrently displayed. Associated color for individual civilizations & pale overlay distinguishing tiles a civilization(s) owns.	Display generated world, minimum 10 visually distinct displayed civilization borders.
E12	M5	Robo Roller must have a feature to generate dungeons in grid format of at least size 50x50 tiles.	Generate a dungeon in grid format size >50x50.
E6	M2,M 3	Provide a method of time based world progression, with proposed alterations generated by the program. Slowest supported time unit iteration speed is monthly.	Have a function which generates potential changes in the world and iterates on a timebased system.
E8	M2	The program must allow saving/loading generated data.	Save data and load said data.

## **Design Objectives**

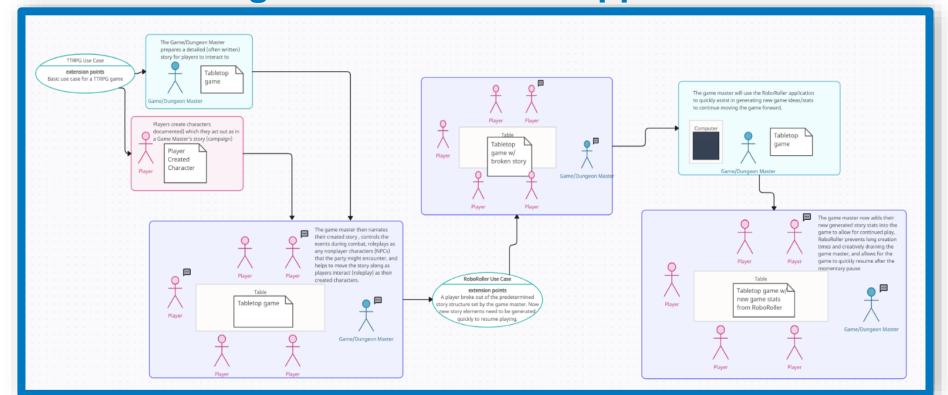
Through software implementation, Robo Roller handles World, NPC, Civilization, Quest, Dungeon and City generation, as well as use AI integration to elaborate quest hooks further if desired. Quests evolve the world, allowing dynamic world changes.

Marketing Requirement #	<b>Description</b> "Robo Roller must have the capability"
M1	To generate/edit a tile-based world, with tiles represented visually with hexagons.
M2	For World Tiles to possess land types, unique features, & civilization possession. All reflected visually.
M3	To generate/edit Non Player Characters (NPC) information.
M4	To generate/edit civilization information.
M5	To generate/edit dungeon layouts.
M7	To allow user(s) to advance time. Time progression system interoperable upon other RoboRoller generation features.

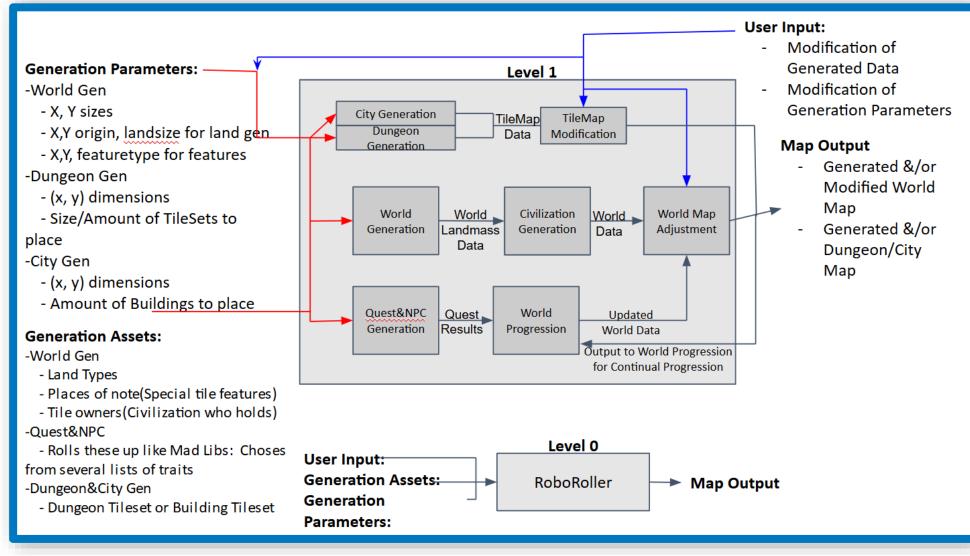
### **Conclusion & Future**

- Robo Rollers completed the set design purpose to ease and assist the creative production workload of the Dungeon Master in TTRPGs.
- If future work continued, main areas of focus should be improvement of underlying generation systems and then further focus on user-centric and visual fidelity of the graphical components.

#### **High-Level Narrative Approach**



#### **Robo Roller Functional Decomposition**



#### **Acknowledgements and References**

Self funded and produced by Cody Vaughn, Isaac Payne, Ryan Fowler and Chris Marozick. Mentored by UAH Professor Jacob Hauenstein, Ph.D.

Reference located - <a href="https://docs.google.com/document/d/1KATWRCp3EjTtA2YjDwOxE6vBFEKlp67uHq421Wih\_ng/edit?usp=sharing">https://docs.google.com/document/d/1KATWRCp3EjTtA2YjDwOxE6vBFEKlp67uHq421Wih\_ng/edit?usp=sharing</a>

Electrical and Computer Engineering of The University of Alabama in Huntsville 496/498