

CIS 700 Final Project Design Document

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- **Introduction**

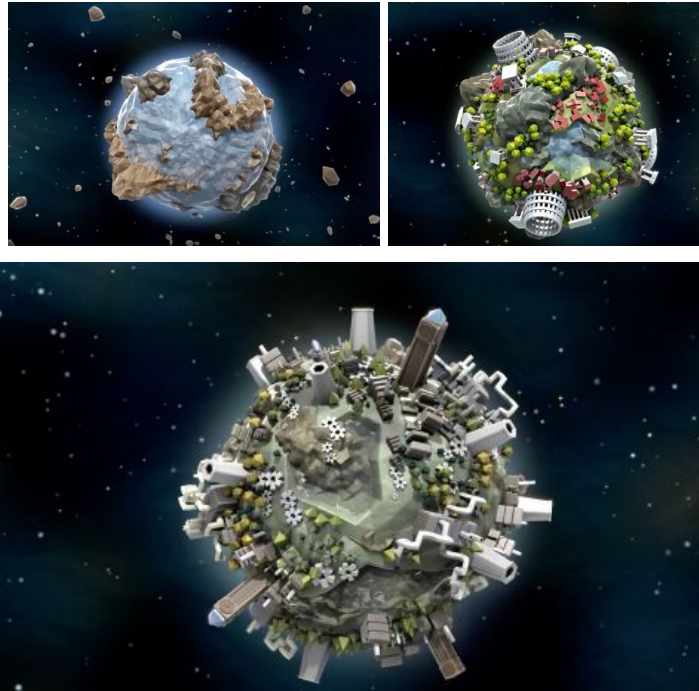
- What motivates this project?
 - A cool way to combine all of the skills we acquired over the course of the last few weeks (Noise, Shaders, Animation).
 - It'll challenge us to make really complex, detailed, and accurate environments into a modular world.
 - It's pretty cool. It's a good way to showcase our individual aesthetics and technical skills, but with our unified theme and focus on transitions, we will have a pretty polished final product.

- **Goal**

- Create a group of related environments that is altered based on music data in the shader. We are planning to modularize the project by creating separate assets, which will be joined together in the end to create unique planets. These unique planets will be animated in interesting ways, using the music data to drive the animation. We will transition between them.

- **Inspiration/reference:**

- <https://www.youtube.com/watch?v=EzsG1uqfDTQ>
- <https://www.youtube.com/watch?v=qARpMpHskTM>
- <https://www.youtube.com/watch?v=rmN8DHZYNCg>



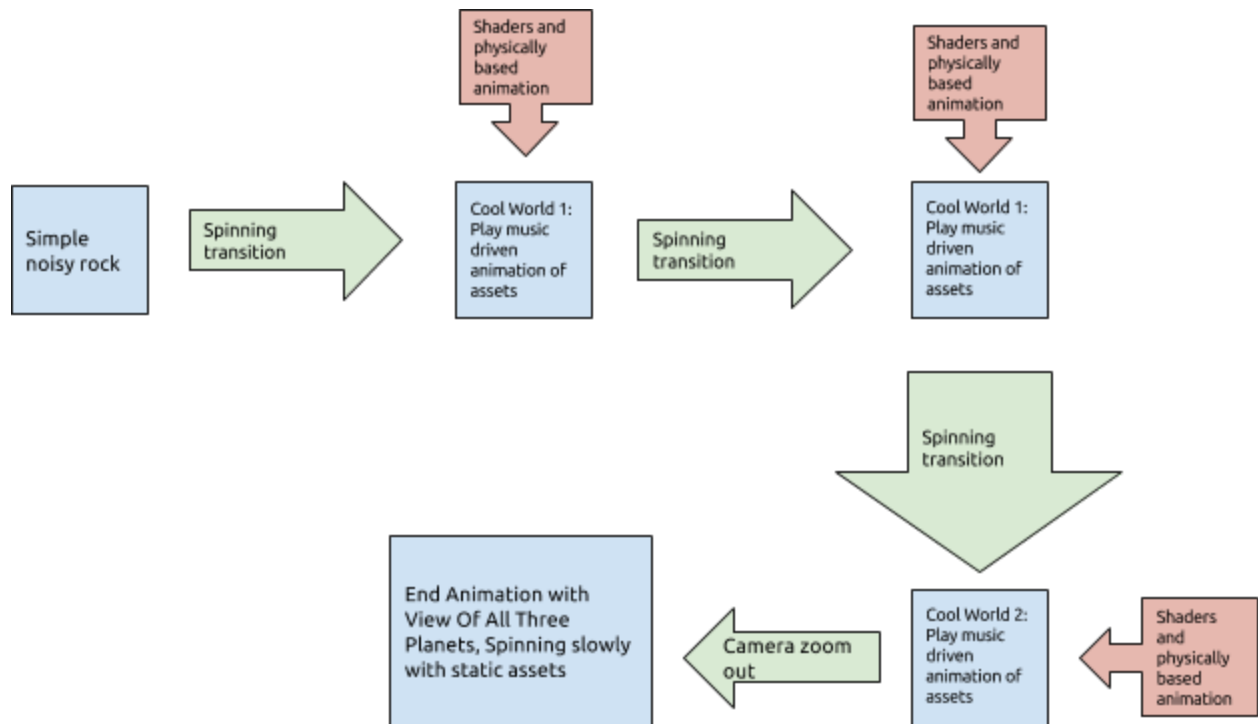
- **Specification**

- Procedural Asset Generation - modularized components will be built that can be easily spawned and combined with others to create interesting environments for each planet (e.g. flowers, terrain, rocks, clouds, buildings)
- Music Visualization - animated planet features based on music (color, movement, shape)
- Transitions between planets - camera animation

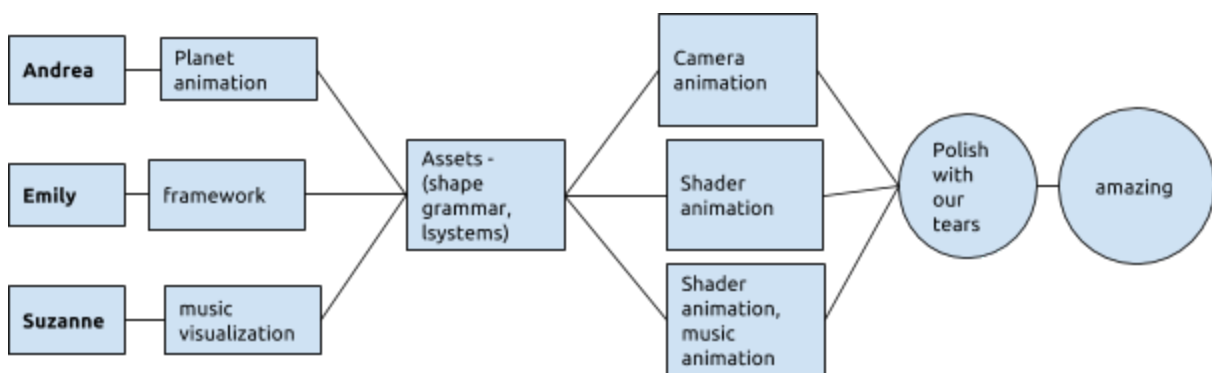
- **Techniques**

- L-systems/grammar rules to populate environment
- Music visualization techniques
- Camera transformations for transitions
- Shaders for animation and transitions

- **Design: Program Flow**



- **Design: Team Workflow**



• Timeline

	Group goal	Andrea's Tasks	Emily's Tasks	Suzanne's Tasks
Week 1 (due 4/18)	<p>Goals for Demo: Have framework completed with modularized code for each world and their assets. Want to make it easy to reuse assets and add to them, while also making it easy to generate new and interesting planets. The framework will be focused on also making sure that animating things based on music and time will be easy. We will also begin working on assets and aim to have at least one of them complete for each person in our group. We also want to create our transitions between each world. We want to present the framework, assets, and transitions in class.</p> <p>Features:</p> <ul style="list-style-type: none"> • Pregenerated LSystem assets to spawn over our worlds. • Using noise to generate our basic terrains. 	<p>Sphere animation (spinning for transitions between each world). Spinning while despawning assets simultaneously.</p> <p>Asset development</p> <ul style="list-style-type: none"> ◦ Develop terrain (water potentially) ◦ plant ◦ mountain 	<p>Framework:</p> <ul style="list-style-type: none"> • World Interfaces • Asset Interfaces • Interfaces will make it easy for importing new assets, spawning new assets, and accessing sphere geometric features • Interfaces will make it easy to call an "animate" or "tick" function for each asset • App and each function will keep track of time and duration <p>Complete one of these three assets:</p> <ul style="list-style-type: none"> • Flowers • Buildings • Crystals 	<ul style="list-style-type: none"> • Audio extraction • Shader materials • Transformations • Asset: Clouds
Week 2 (due 4/25)	<p>Goals for Demo: We want to showcase animation with music and potentially more assets, or polished assets from last week. We will incorporate the shader and music animation into the elements of our planets. Data will influence the appearance and movement of the planets and their assets. We will showcase a rough version of the entire combined animation, including basic planets with their assets spawned onto them.</p> <p>Features: (Physically based animation - like birds / planes / projectiles)</p>	<ul style="list-style-type: none"> • Camera movement / controls • work on assets 	<ul style="list-style-type: none"> • Shader animation for particle system (for flower petals flying around the planet) • Complete the assets 	<ul style="list-style-type: none"> • Shader animation (growing/bouncing assets) • Work on assets
Week 3 (5/3)	<ul style="list-style-type: none"> • Integration & polishing. Planets and individual animations should be complete at this point, so all work will be towards having the final, polished animation. We hope to choreograph transitions with audio. 	<ul style="list-style-type: none"> • Transitions between planets. 	<ul style="list-style-type: none"> • More cool shaders? Helping with integration. 	<ul style="list-style-type: none"> • Music integration