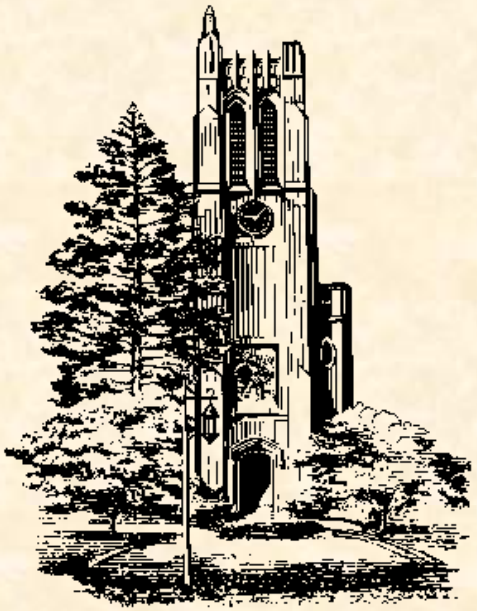
MICHIGAN STATE UNIVERSITY

Alpha Demonstration
Synthetic Vision Display



Team 03:GE Aviation

CSE 498, Collaborative Design

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Project Overview

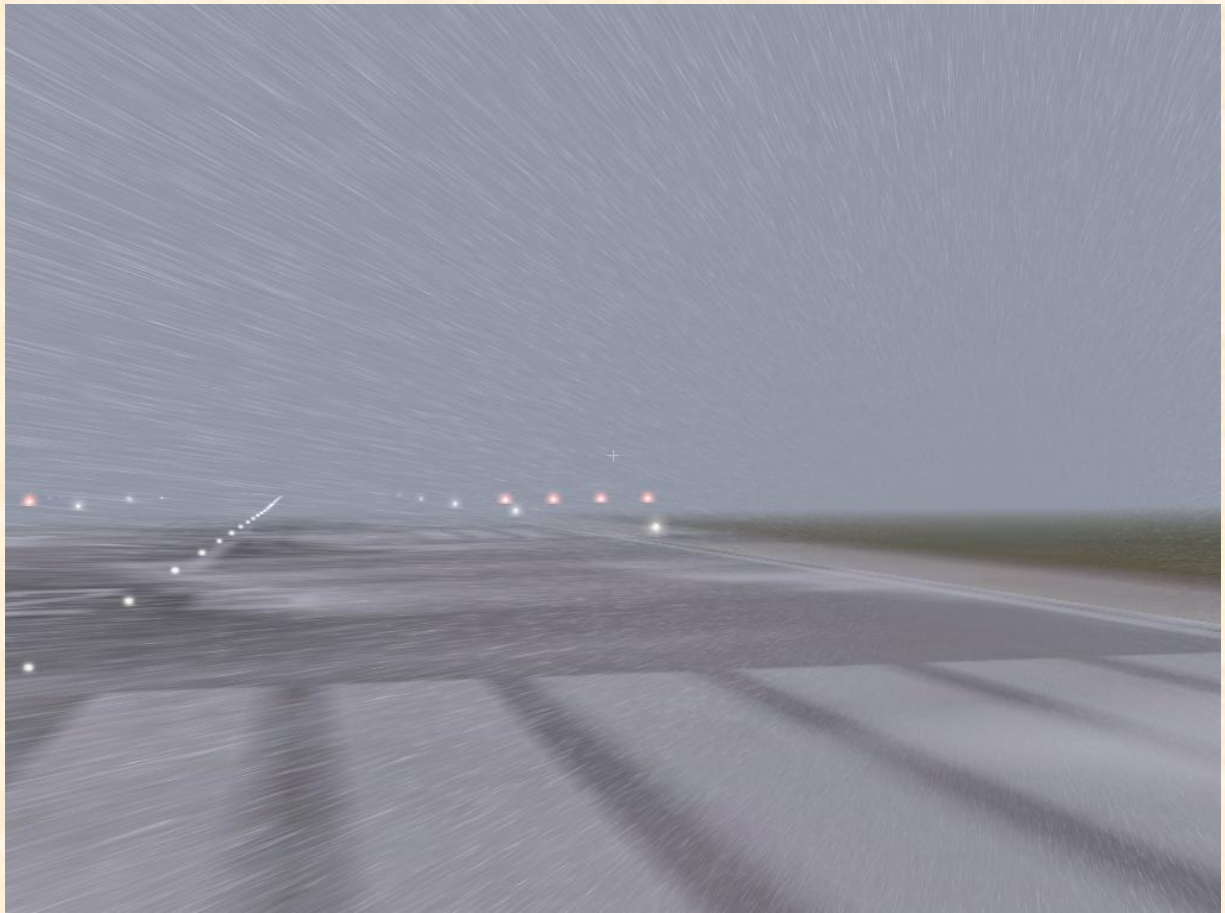
What is a SVD?

- LCD-like display in cockpit
- Displays computer generated terrain
- Provides navigational symbols
- Presents basic flight information
- Features that increase a pilot's situational awareness

Project Overview

Why?

Imagine trying to land in this:



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Project Overview

Why?

- Assist in low visibility situations
- Reduce pilot workload
- Affirm pilot decisions
- Increase situational awareness
- Provide proper information based on situation

Project Overview

How?

- Use X-Plane as terrain database and flight data generator for simulation
- Sending flight data via UDP
- Sending terrain meshes via TCP
- Rendering everything using OpenGL

Architecture Illustrated

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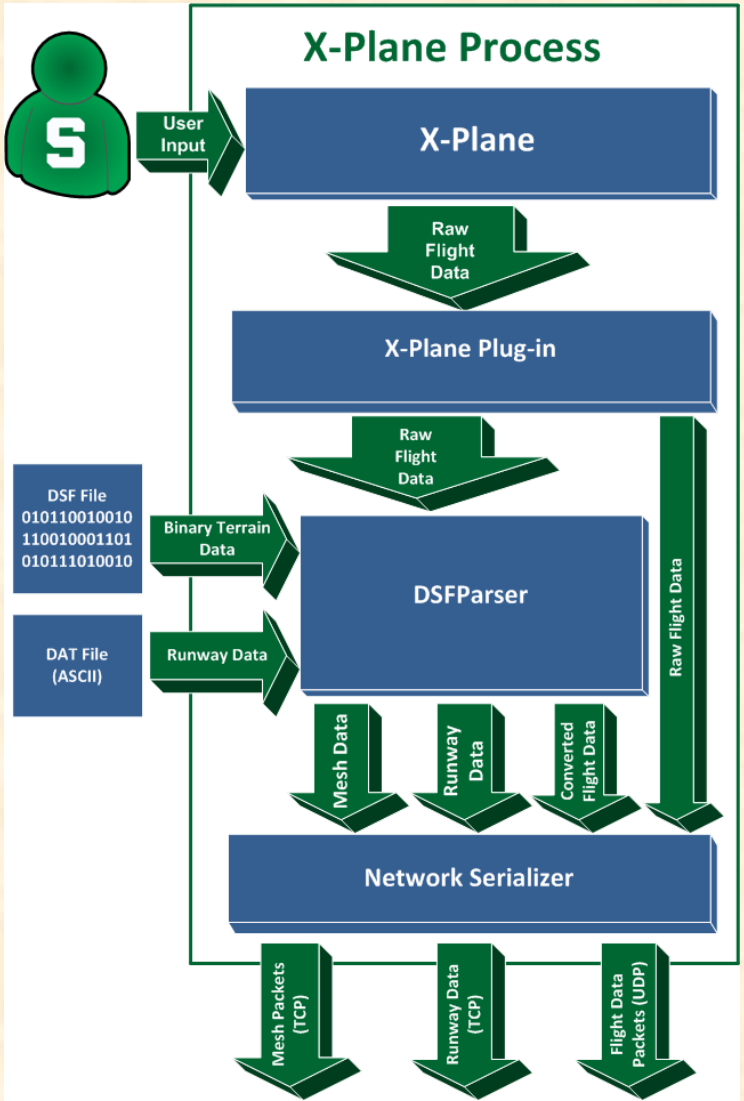
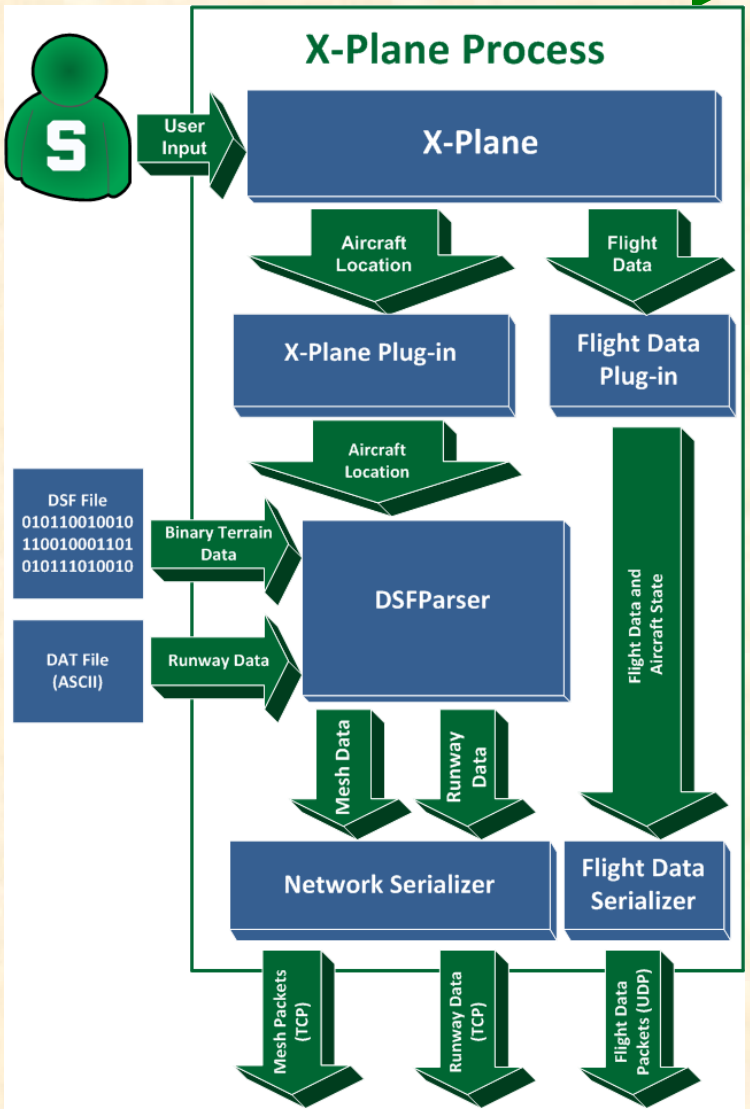
Before:

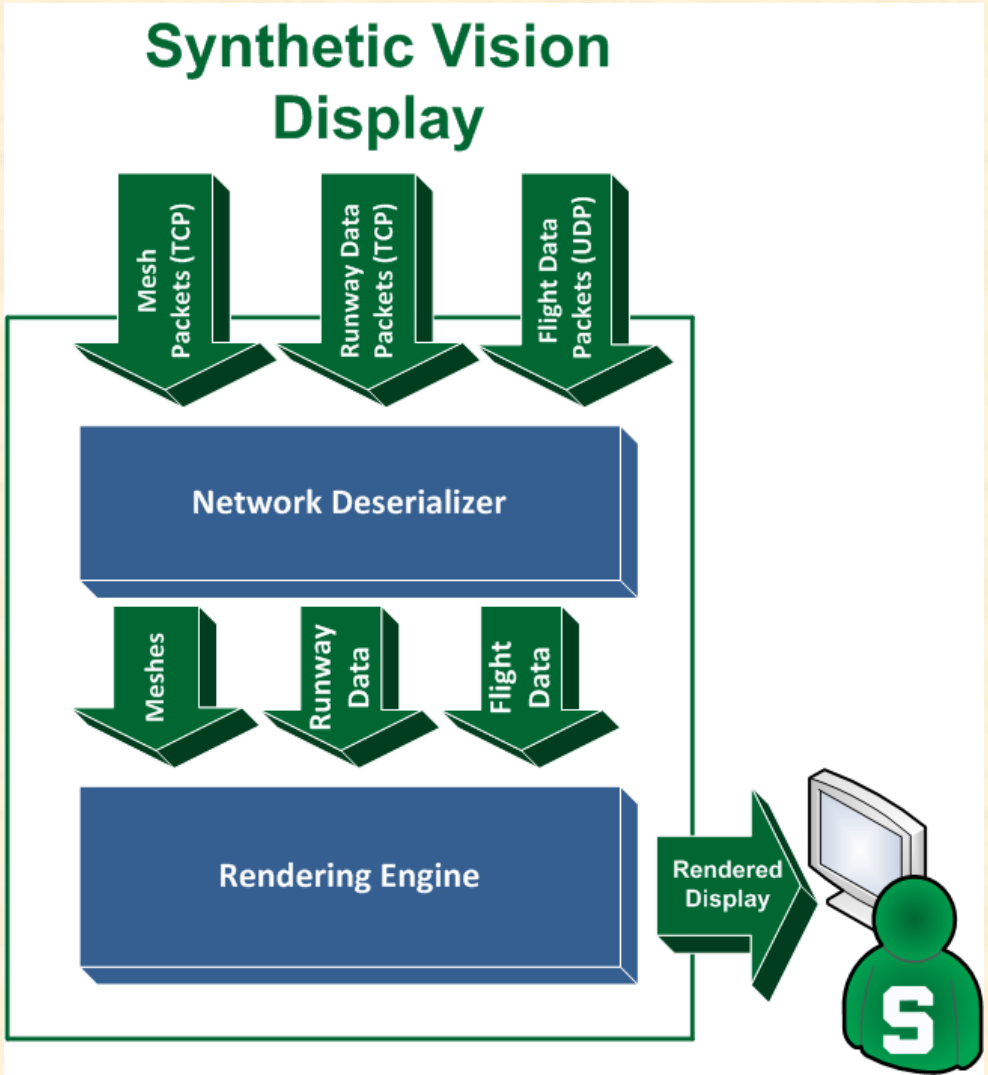


Now:



Architecture Illustrated

Before:



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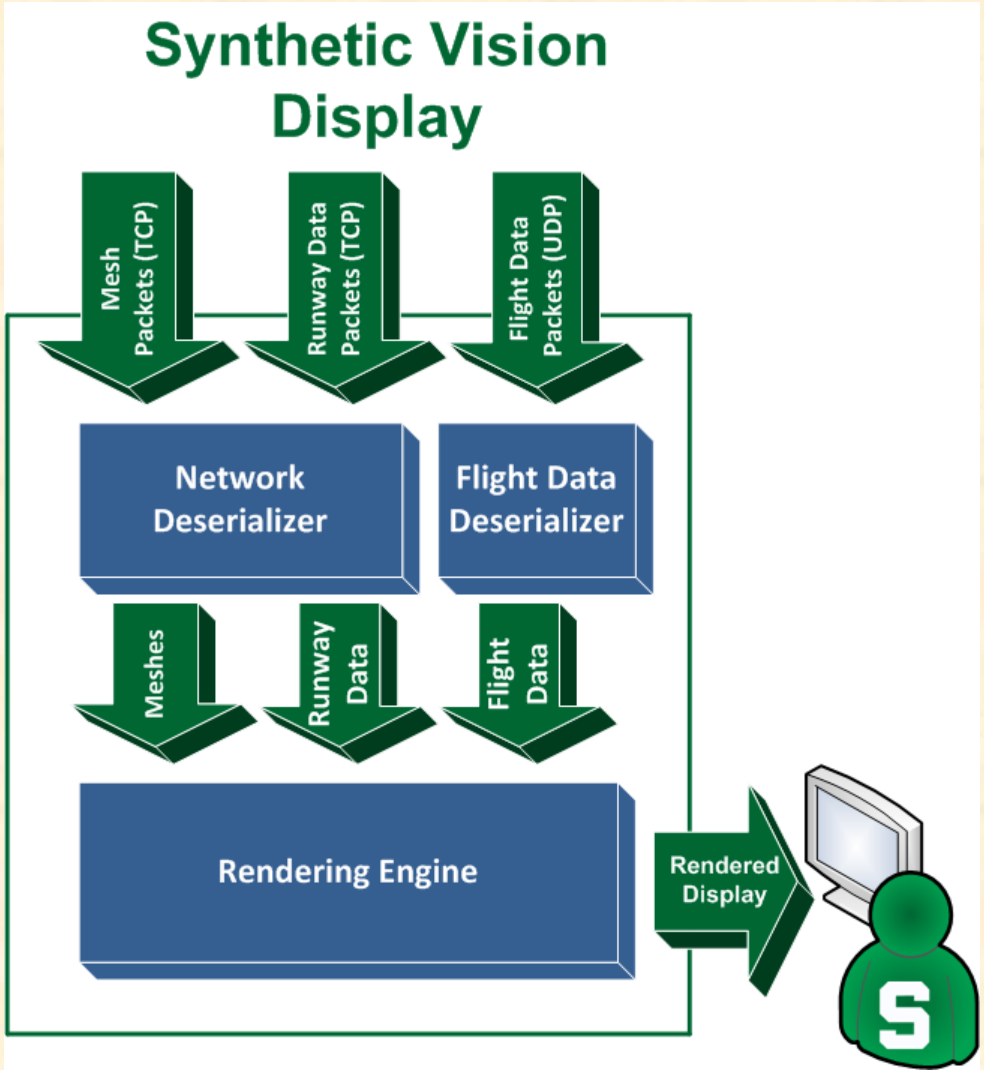
Architecture Illustrated

Now:



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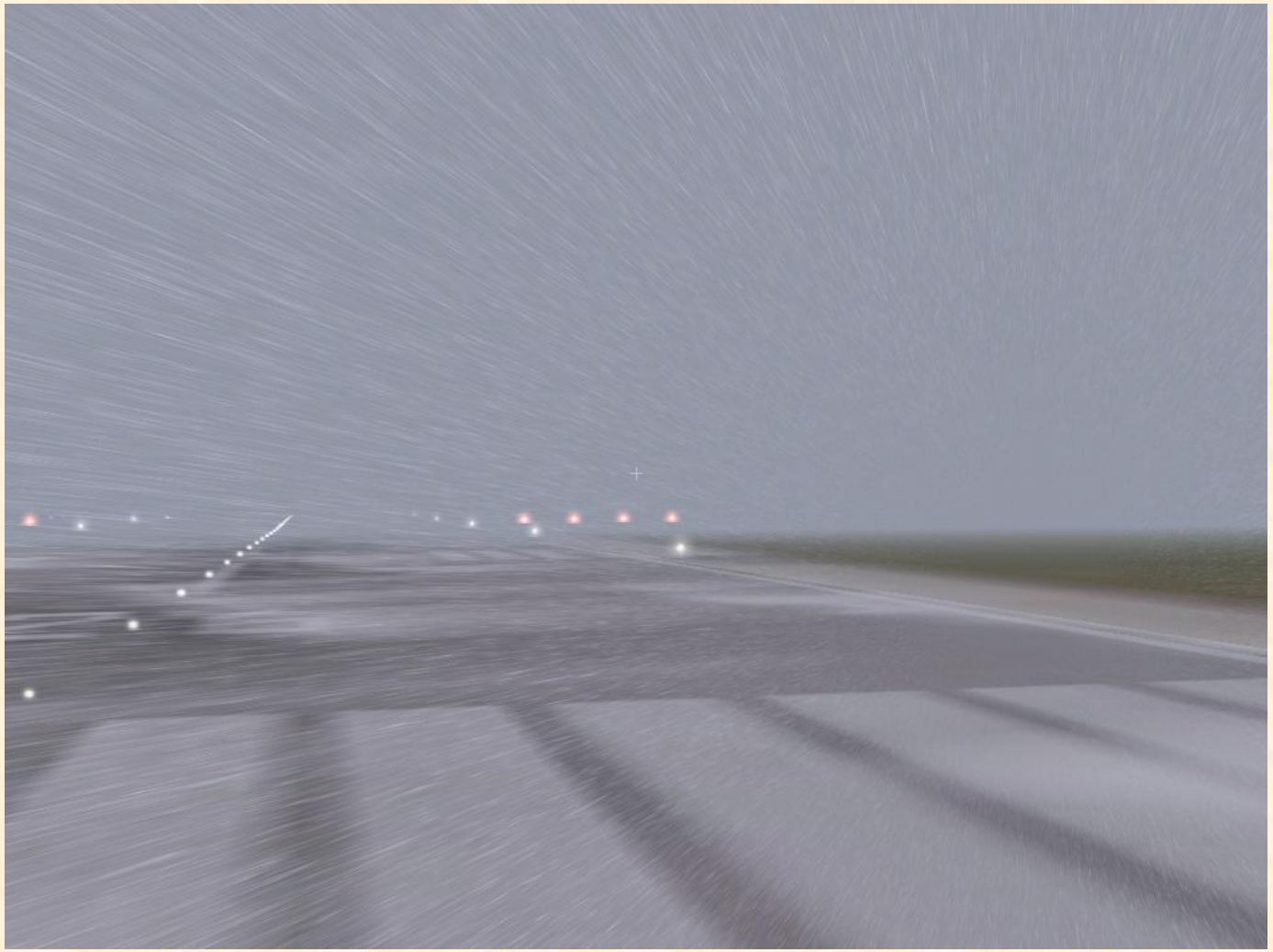
Screen Shot



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Screen Shot

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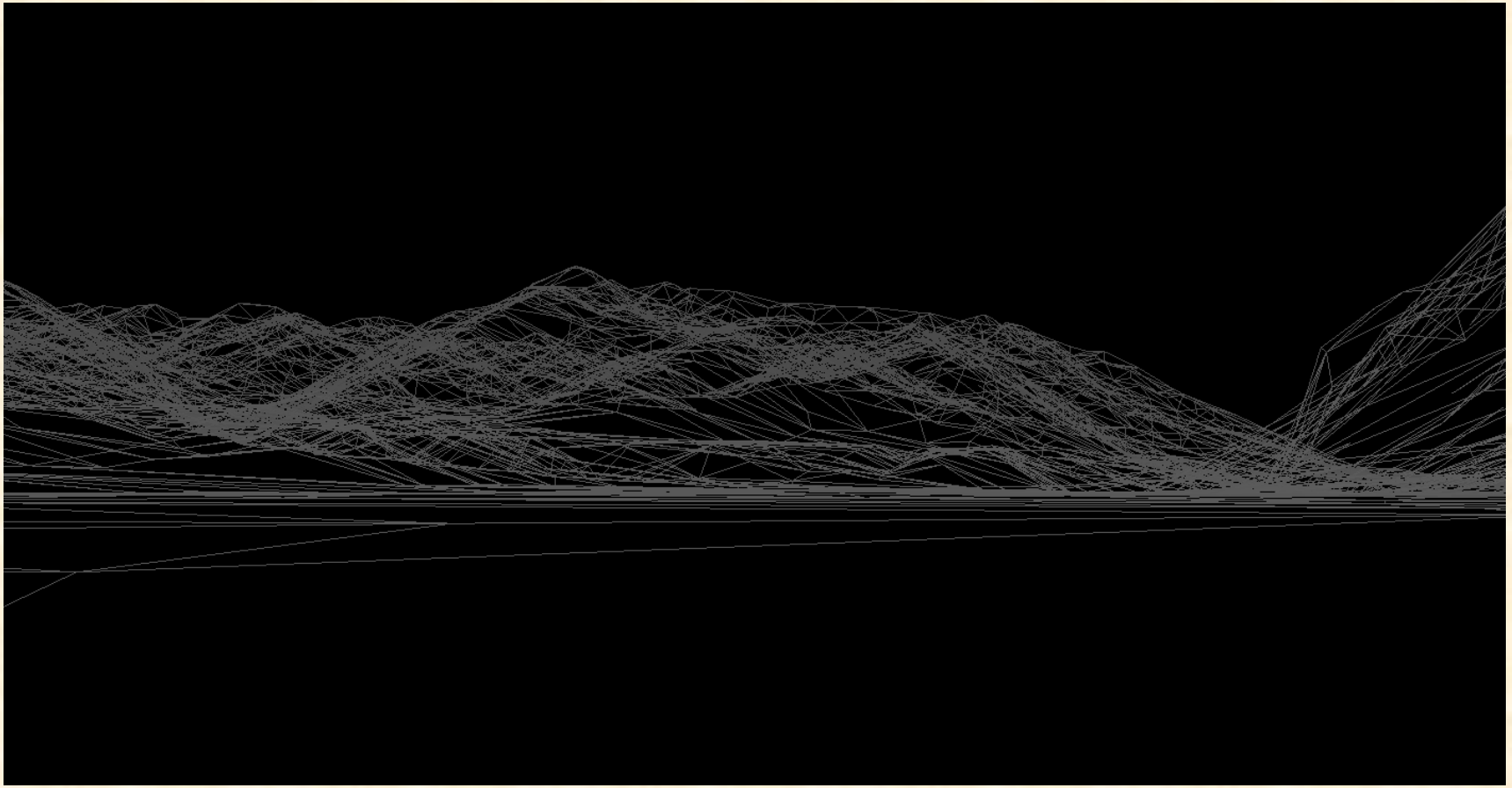
Screen Shot



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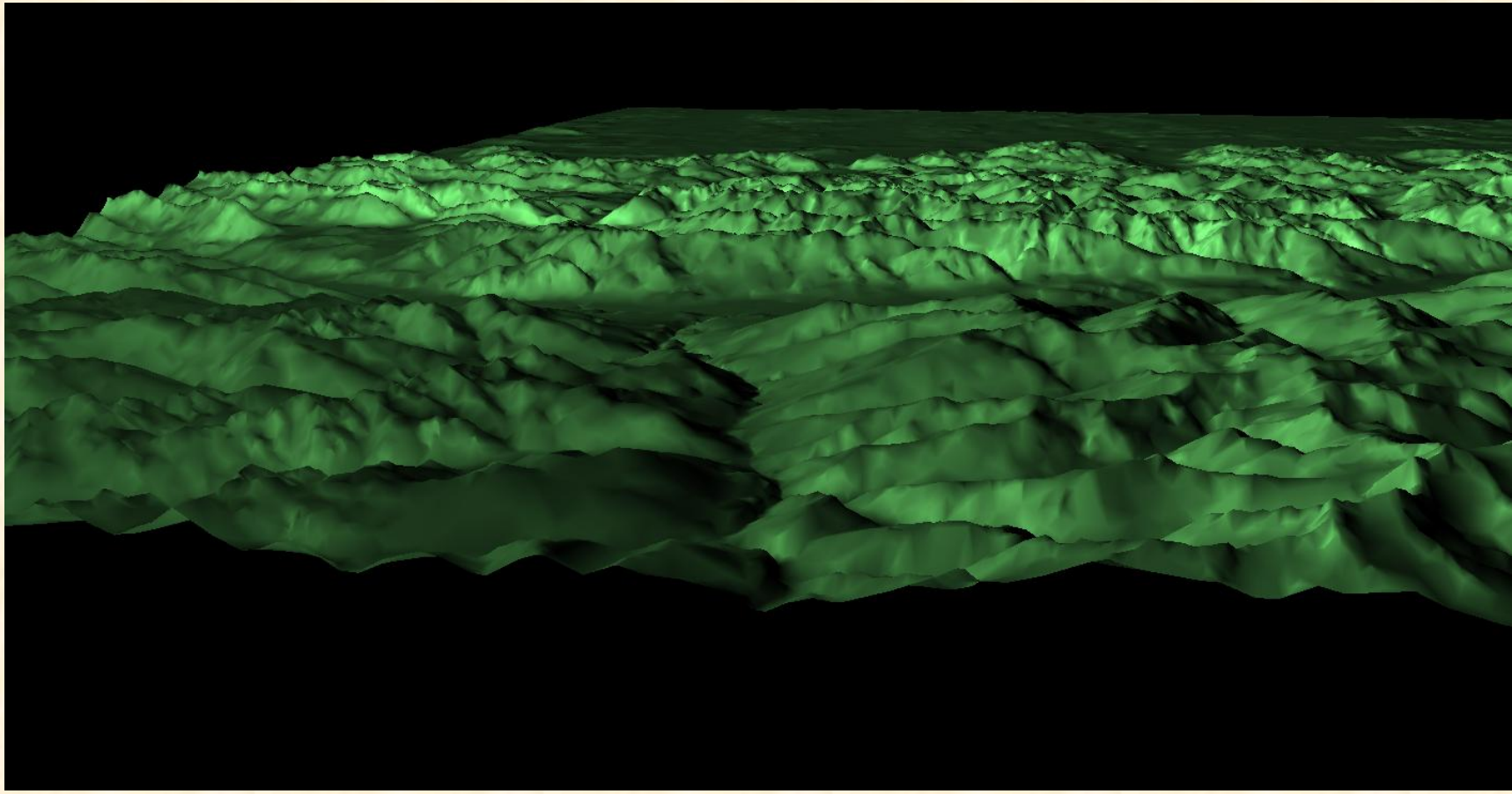
Screen Shot



What's left to do?

Terrain Data

- Transfer terrain data over TCP vs. reading from a file
- Smart algorithm to decide when to parse and send
- Need to access runway and navigation data

What's left to do?

Rendering Engine

- Caching algorithm and handling of terrain mesh
- Optimizing our OpenGL calls
- Implement features: HITS, terrain intersection, top-down view, proximity shading
- Draw runways and other navigational symbols