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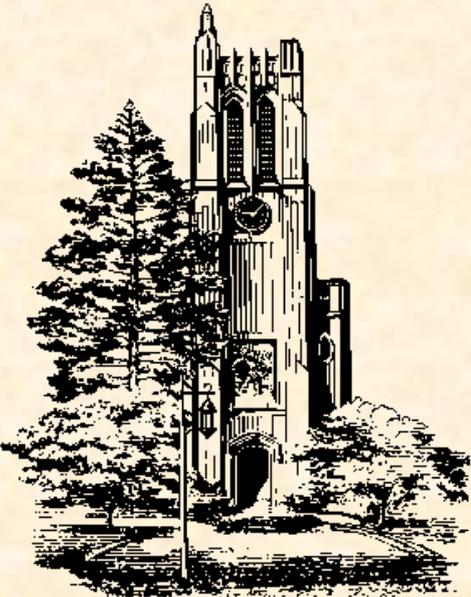
# Project Plan Lateral Map Display

Team GE Aviation  
CSE 498, Collaborative Design

Adam Dupler  
Corey Sites  
Jason Rigdon  
Jordan Clare

Department of Computer Science and Engineering  
Michigan State University

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# Project Overview

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- Lateral Map Display
  - Top down view of aircraft's position
  - Aids in navigation
  - Multiple layers that can be toggled on/off
- Control Panel
  - Buttons to change active layer(s)
  - Insert/delete waypoints
  - Dials to change map mode, zoom in/out
  - Utilize controls in X-Plane to update external control panel



# Functional Specifications



- Lateral Map Display
  - Display information pertaining to aircraft's situation
  - Show possible risks including air traffic, hazardous terrain, and inclement weather
- Control Panel
  - Include buttons for weather, traffic, waypoints, airports, VORs, terrain, etc.
- Optional Extended Functionality
  - Display horizontal view of surrounding terrain (Vertical Situation Display)
  - 3D tilting view to see terrain elevations



# Design Specifications

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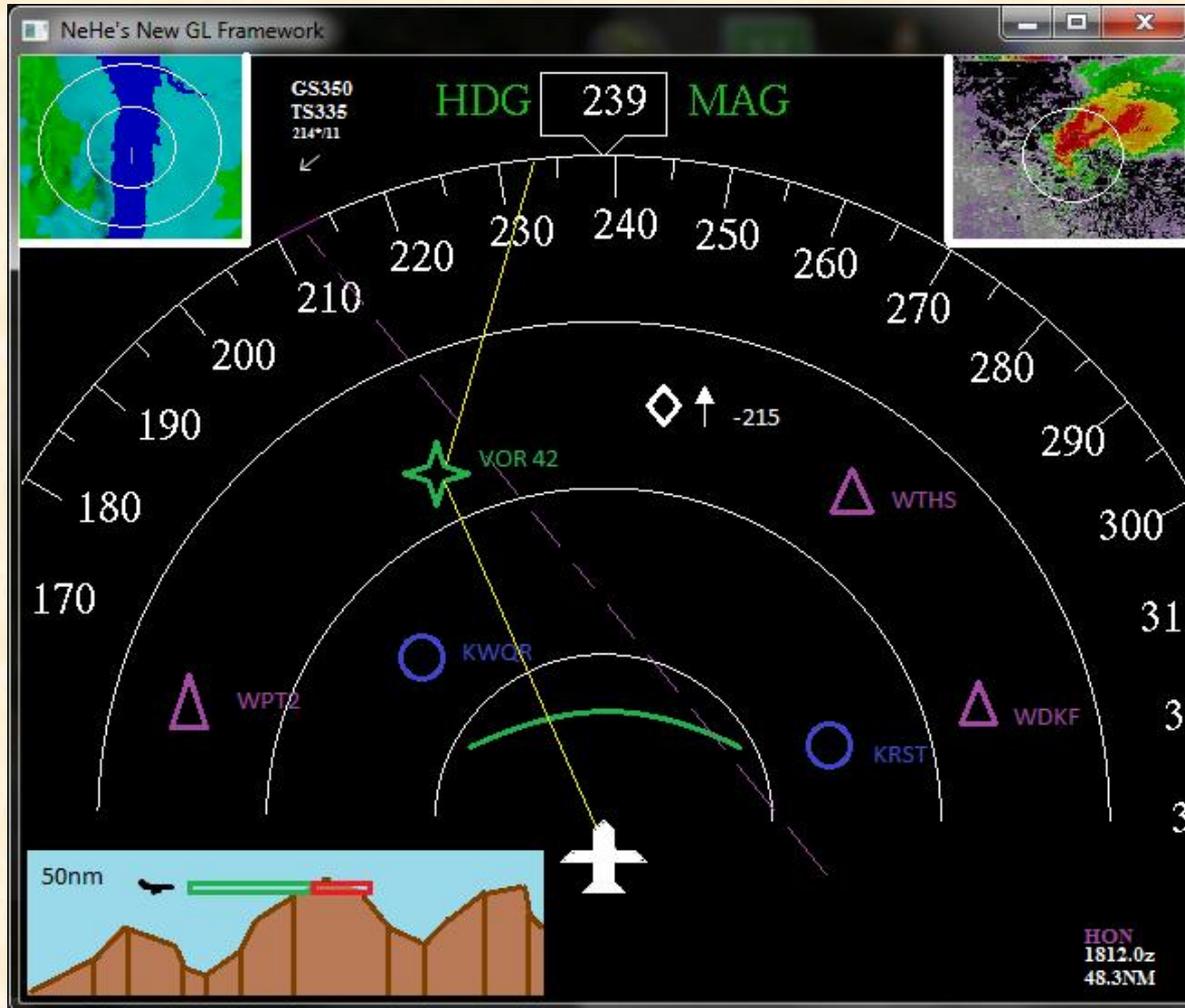
- Terrain data transmitted over network and rendered using C and OpenGL
- Lateral Map Display created using OpenGL and GLUT in Visual Studio
- Flight data sent over network using separate plug-in
- Rendering component receives flight data and displays icons as 2D overlays



# Screen Mockups



Team GE Aviation



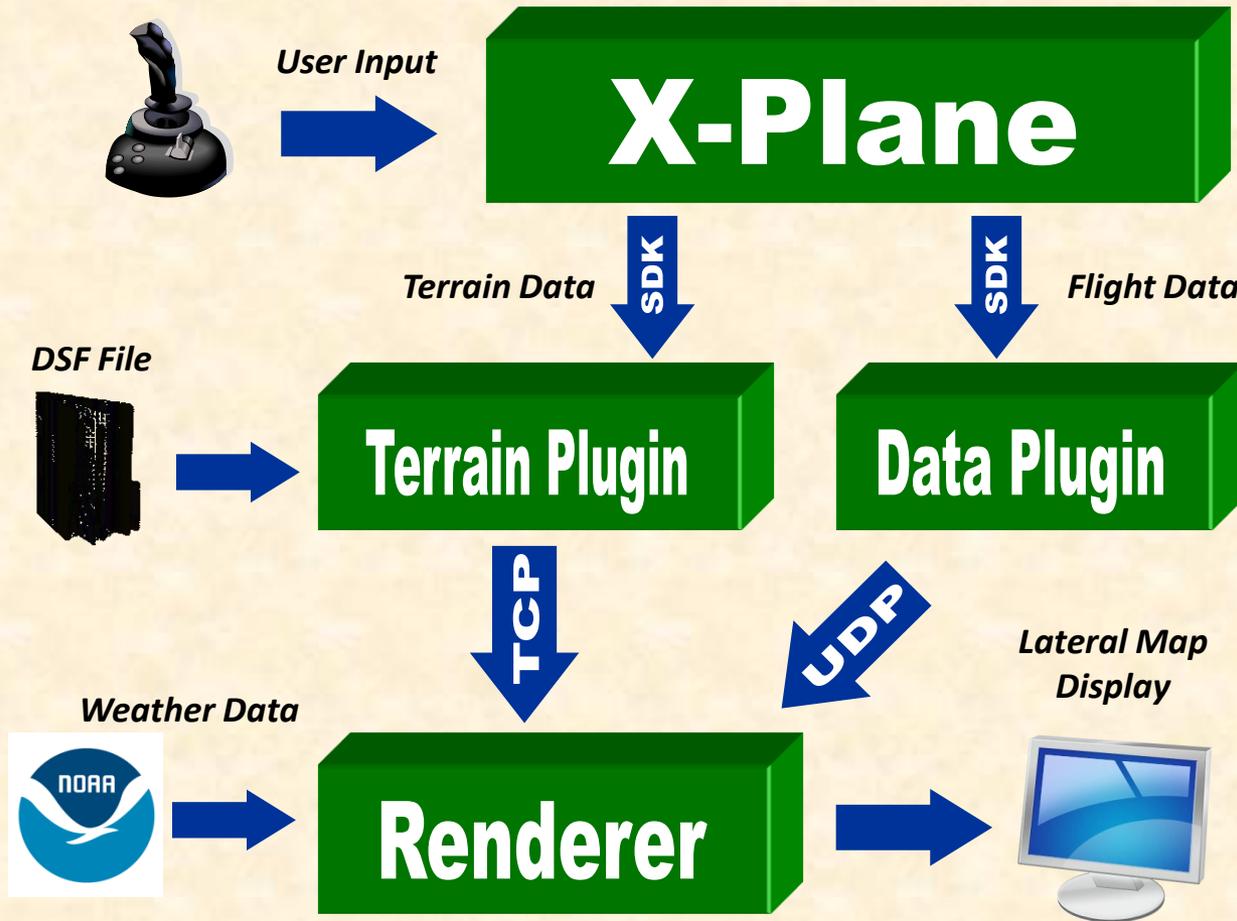


# Technical Specifications

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- Main Machine:
  - Runs X-Plane and plug-ins, sends flight and terrain data over network
  - DSF parser converts terrain data to be rendered by the client
- Secondary Machine:
  - Runs rendering component, receives data from X-Plane
  - Displays Synthetic Vision Display, Lateral Map Display, Control Panel, and Vertical Situation Display

# Architecture Illustrated





# System Components

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- Hardware Platforms
  - One machine running X-Plane and custom installed plugins
  - One machine running client rendering program
  - Machines networked to stream data
- Software Platforms / Technologies
  - X-Plane
    - Realistic flight simulator to be used as data source to drive the Lateral Map Display
  - Visual Studio, GL Studio
  - OpenGL, GLUT



# Testing

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- Data Output
  - Plug-ins will be tested to ensure that data being exported is correct
- Data Parsing
  - Make sure that data read by rendering software is equivalent to data in X-Plane
- Data Display
  - Ensure that data displayed in Lateral Map Display is consistent with that shown in X-Plane monitors
- Code
  - Avoid memory leaks and inefficiencies



# Risks

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- Maximize compatibility with previous code
  - Port code to ANSI C, add features to flight data plug-in
- Performance
  - Utilize POSIX threads to avoid lag in X-Plane
- Weather data
  - Determine where to obtain up-to-date weather data that can be displayed in a radar map