Visualization and Software Engineering Strategies for Tactical Decisions Advances

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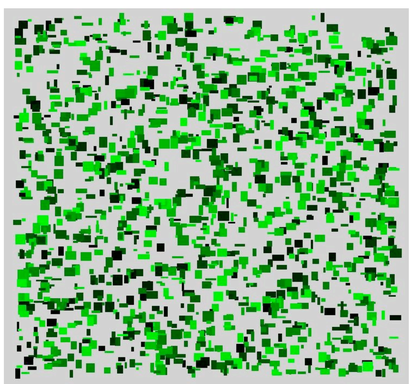
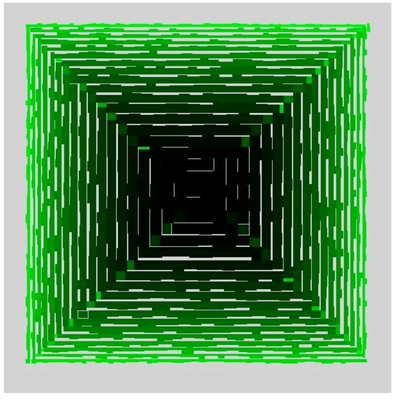
Developed in the MSE/Rowan Research & Development Laboratory

Decision Aids: Organize

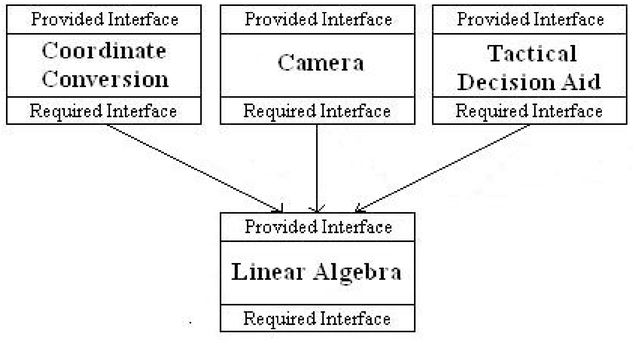
Before



After



Overall Architecture



Abstract:

Mission Solutions Engineering's (MSE) Advanced Display Infrastructure (ADI) is an application that provides tactical and non-tactical information to the user through a display of the Earth. ADI uses the World Geodetic System 1984 (WGS 84) datum to display the location of units and assets. Decisions aids are used to assist the user in making important decisions quickly. Third party rendering software and collision detection libraries are used by ADI too.

This research presents an API to be used by ADI. This API provides MSE the ability to not be dependent on specific proprietary rendering software. The camera is able to provide the ability to get and set the orientation angles, get and set the field of view angle, get and set the position of the camera in three dimensional space, as well being able to change the camera's orientation and position once set.

The API is independent of a coordinate system. The Cartesian Coordinate system is used to provide its functionality, but that might not be the coordinate system the user needs for a specific situation. The user is able to convert the Cartesian Coordinates of a given object to WGS 84 and vice versa.

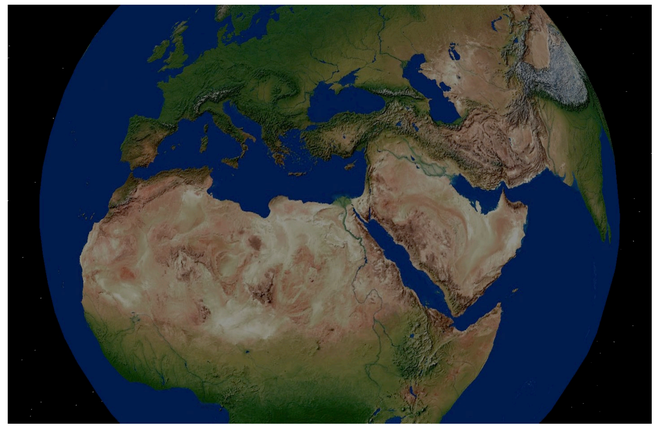
Collision detection is provided, as the API provides MSE the ability to compare the positions of two given entities within ADI. An entity can be a point, line segment, convex polygon, or a circle. The API can determine containment, shortest distance between two entities, the area of intersection of two entities, and whether a moving entity will intersect a boundary in a given amount of time.

The API provides a framework, which allows new decision aids, or services to be created. This research produced a service that will optimize the area of the high level space, meaning the low level entities will be repositioned to cover the most area possible.

Camera Controller

Pitch

Roll



Zoom