

Visualization of Geospatial Data as an Analytical and Educational Tool



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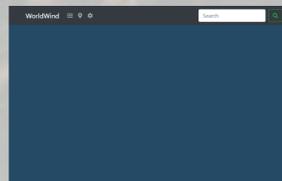
Introduction

WorldWind is an open-source API designed to visualize and interact with geospatial data. Available for Java, Android, and browsers, WorldWind draws from multiple libraries to provide and visualize geographical data. In contrast to 3D globes, WorldWind is not a completed application designed for the end user. It is a software development kit that software engineers can use to develop their own applications. With WorldWind handling the visualization, software engineers can focus on solving problems specific to their own domain and quickly build their own geospatial application.

Methods

Web WorldWind API requires of the following:

1. HTML template using Bootstrap



2. The globe through the WorldWindow



3. Geospatial features by the chosen imagery format and sources



4. Implementation of features to interact with the data



For the full library, visit: <https://nasaworldwind.github.io/WebWorldWind/>

Application



Figure 1. Screenshots of a WorldWind application depicting an animation of the time series over a year using Blue Marble imagery

WorldWind has been utilized as the engine for a variety of analytical tools. By collecting data from multiple libraries, WorldWind is capable of performing and visualizing complex calculation. This not only allows for the prediction of weather patterns, but how that weather will affect geographical features as well, all on a mobile platform. It also supports the understanding of geospatial phenomena in an educational setting. By providing a medium for interacting with data that is current and accurate, students can observe geographical features at different levels of data.

Acknowledgements

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Future of WorldWind

- Improvement of terrain data through Open Geospatial Consortium's Web Coverage Service (WCS) and compound elevations



Figure 2. Screenshot of the current implementation of WCS with compound elevations in development

- Improvement over Web Map Service and Web Map Tile Service by fully abstracting version negotiation and document retrieval
- Allows for the observation and display of multiple elevations
- Enabling these two features to work together to dynamically creation and removal of elevations to be covered in response to a UI action
- Enhancements to shape surface rendering performance, surface shape editors, navigation interface, and navigation near terrain
- Expanding the tools and support on the website to accommodate new developers
 - Improvements to documentation
 - Additional tutorials
 - Developing new examples

References

WorldWind Webpage - <https://worldwind.arc.nasa.gov/>
Web WorldWind Demo - <https://zglueck.github.io/workshop-demo/>

