Urban Climate Data Visualization and Exploration Tool
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Introduction

• Municipalities need a visualization tool to support heat mitigation efforts (e.g., to optimize tree planting)
• The tool should integrate heat, land use, and socio-economic data
• Decision-making tool will help minimize heat impacts on vulnerable populations

Research Goal

Develop a visualization and exploration tool that is
• easy to learn and use
• open-source
• web-based, so anybody can
• work with multiple datasets at a time
• detect hotspots easily without expert knowledge

Technologies Used

Web interface: React, kepler.gl
Server: node, mongoDB

Results

Website URL: https://shadelab.vercel.app

Features

This tool assists the general public, local governments, and decision-makers in
• mapping and analyzing millions of urban climate data points (sky view factors, mean radiant temperature, surface types [1-3]
• merging, intersecting, and masking multiple available data layers
• creating overlays and heatmaps
• refining and filtering out residuals
• exploring data at fine spatial scales
• integrating vector and raster data
• accessing and displaying datasets that otherwise require special software
• identifying several key factors that impact cities’ urban climate

Future Work

• Implement lazy-loading technique to increase map responsiveness and reduce client-side buffering time
• Add support for real-time data streams
• Integrate with other GIS tools to allow effortless data import-export

References: