Final Project Proposal

CPLN-692 / MUSA-611
JavaScript Programming for Planners and Designers
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Project: An Interactive Web Application Mapping Elderly 'Riskscape' in Singapore

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Background

Urban planning in Singapore is overseen by the Urban Redevelopment Authority (URA). Having interned at URA, I found that while there is a gradual shift towards the use of Geographic Information Systems (GIS), most of the planning remains resistant to the technology and reliant on 'gut feel'.

Currently, an area of major concern is in how to plan for Singapore's rapidly aging population as part of the 'Aging in Place' approach to support growing old within your neighborhood and community, rather than overloading nursing facilities and tightening land availability (Tan, 2016).

My project aims to plug the gaps through an interactive "overlay analysis" web map that takes in expert opinions on how various factors affect elderly risk, weigh them based on their importance and visualize them on a single platform.

The goal is **not** to override planners' expertise but to capitalize on existing experience and insights of planners and consolidate the range of factors for consideration, rather than have them done separately. This, in turn, can improve the planning process, achieving the following **objectives**:

1. Assist planners in visualizing and allocating resources for 'Aging in Place', especially in high-risk areas, to improve the lives of the elderly in Singapore
2. Offer planners an extra tool to effectively communicate planning ideas to relevant agencies and the public through visuals.
3. Encourage the use of GIS and contribute to the greater vision of Singapore being a 'smart city' (Watts and Purnell, 2016). The interactive web app should be easy even for users without a GIS/technical background.

User Experience and Design Spec

Figure 1 shows a draft concept of how the final product would look like. Users will be able to select and deselect the risk factors that they are interested in and specify the weights (based on their perceived importance). The application will then calculate and map the overall risk landscape on to the map of Singapore. On the map, users will be able to zoom in/out, pan and reset to recalculate the factors again.

Clicking on each factor will launch a dialogue box that provides a short description of it's impact on elderly risk. Additional information about the project can also be accessed on a separate page via the dropdown menu of 'About'.
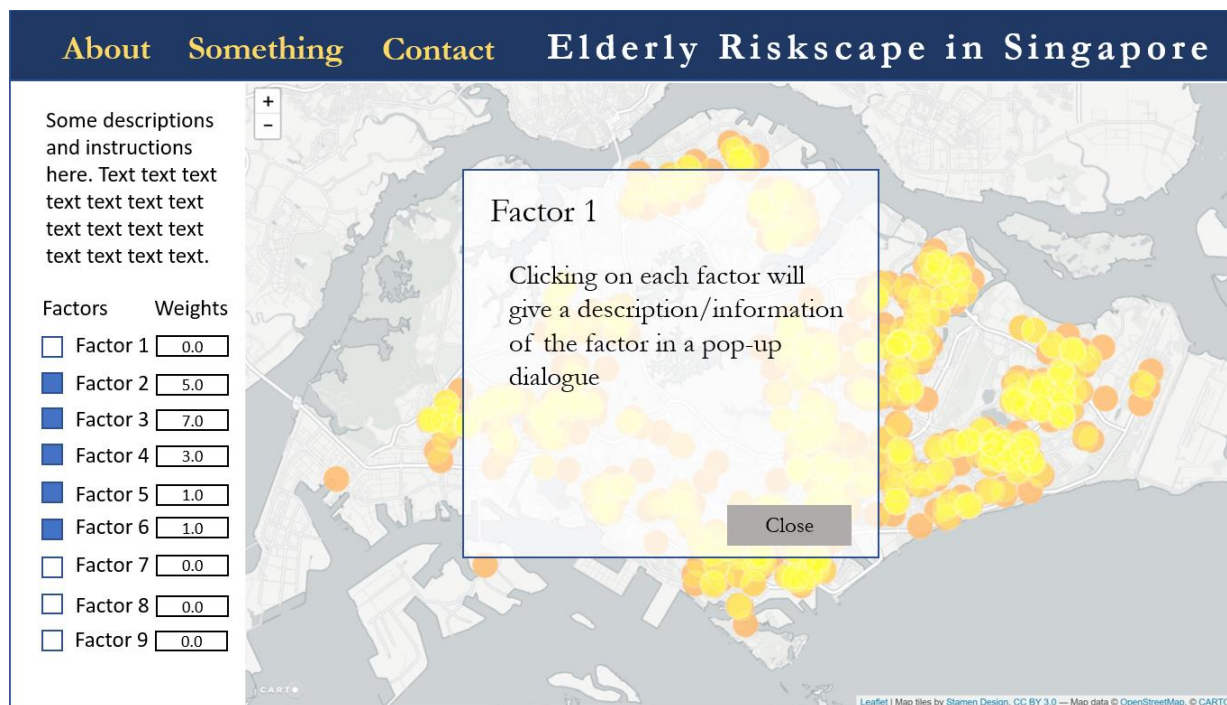

Figure 1. Sample of Web Map Concept

Tools

- o *ArcMap* : Pre-processing of buffers, intersections, raster calculations may be necessary to process various shapefiles so that they are useable or can speed up the overall processing time of the app to reduce lag time.
- o *Material Design Lite* : A frontend framework for the app layout and aesthetics
- o *GitHub and Carto* : Able to host data and files online. Carto is also able to process and filter data through its Structured Query Language (SQL) Application program interface (API) which can then be mapped
- o *Other useful JavaScript Libraries* : JQuery, Underscore, Leaflet

Data Acquisition and Processing

This project will be done as an **extension** (not the actual submission) of a project in another class - CPLN 680/MUSA 800 Advanced GIS. Therefore, the following data has already been collected from Data.gov.sg and will be processed accordingly:

- o *Health Components*: subsidized clinics, dengue hotspots, Eldercare and disability services
- o *Public Services*: public housing service centers, retirement fund service centers, parks, healthier eateries, retail pharmacies, fire stations/posts, voluntary welfare organizations
- o *Community Services*: Residents' Committees, community gardens, community centers, Community Development Council
- o *Education*: Silver Infocomm Hot Spots and Junctions

Depending on the type of factor/amenities, the way that the data is pre-processed on ArcMap may change. For example, buffers around each point may be created differently: some factors should be within walking distances, but others may have a larger buffer of being within a short drive.

Anticipated Difficulties

Given the complicated nature of calculations by weights and distances that are done on the fly, there is a possibility of a sluggish performance by the app. Therefore, there may be a need to find means to reduce loading time can enhance user experience.

For this project, **not all the factors** may be included initially. Rather, the project can serve as a prototype for future development of a more comprehensive and intelligent app.