



The Future of Navigation

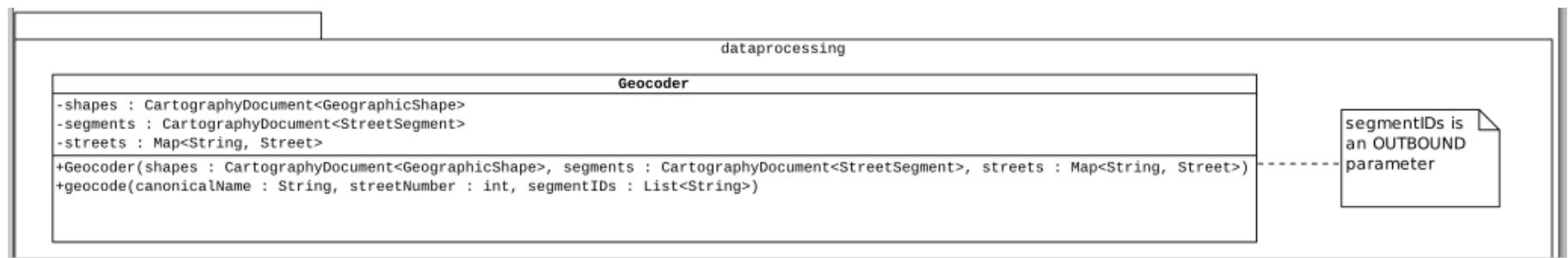
Navigation System v2

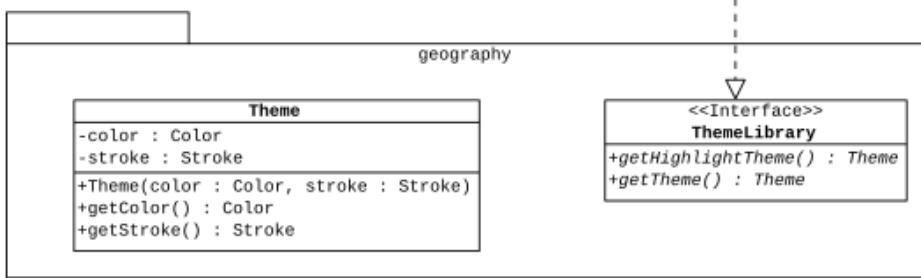
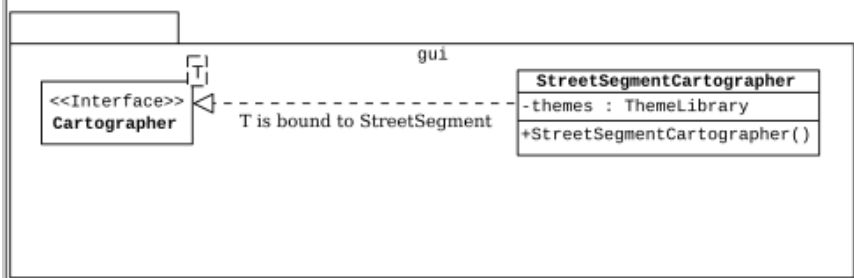
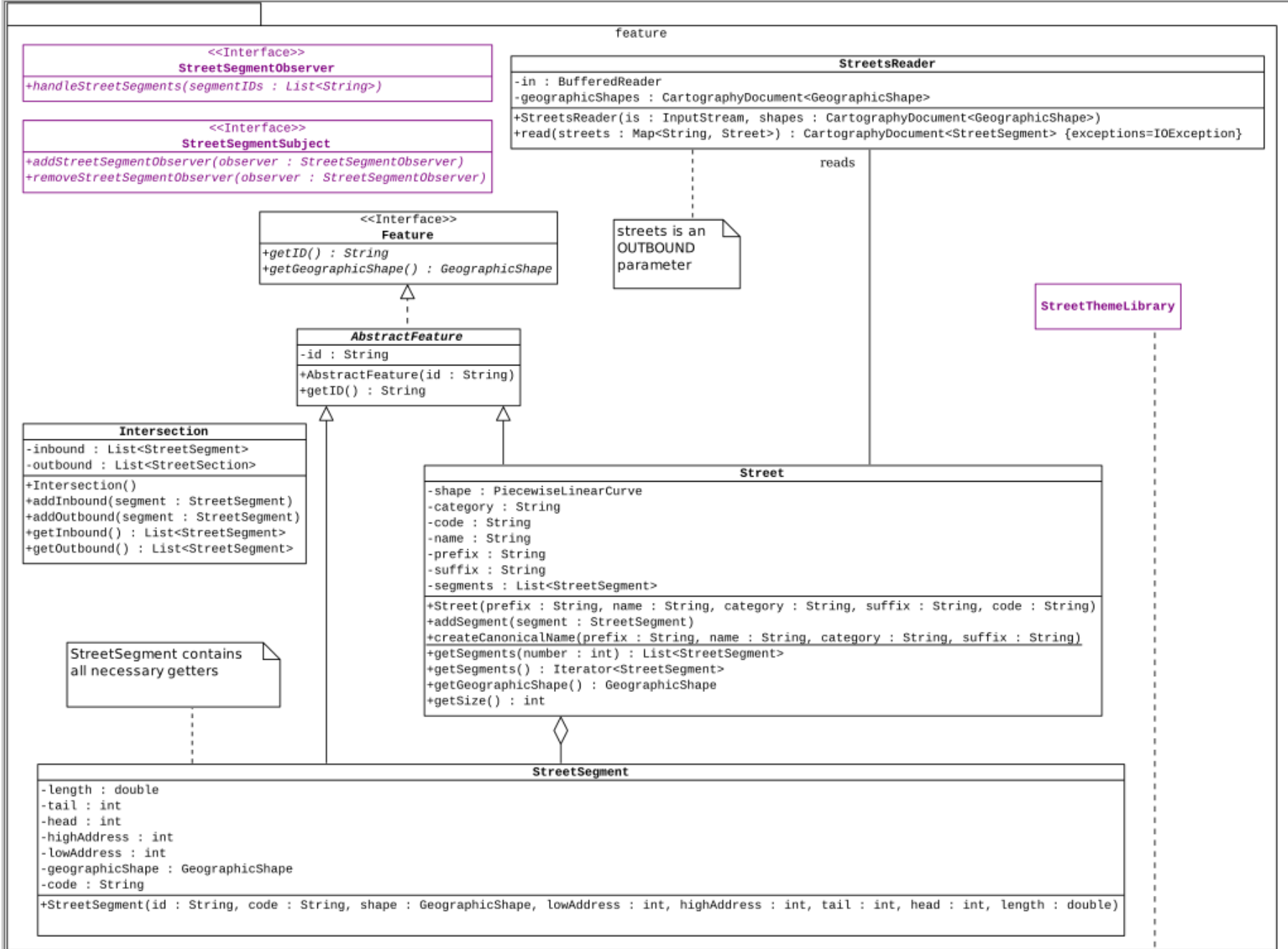
Purpose

Version 2 of the navigation system will provide the user with street maps and the ability to geocode street addresses.

Design

The design of the system is summarized in the following UML class diagrams. Note that the components in jade green are part of the Java API and the components in purple have been provided to you.







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Specifications

This section contains design specifications for some of the components above. For the others, the UML diagrams should provide all of the information that you need.

The Feature Interface

A Feature is an element of a thematic map.

The AbstractFeature Class

This class provides the basic functionality of (most) objects that implement the Feature interface.

The Intersection Class

This class is an encapsulation of an intersection in a street network. In a mathematical sense, it is a vertex (or node) in a graph.

The StreetSegment Class

This class is an encapsulation of the portion of a street that connects two intersections. In a mathematical sense it is a link (or arc, or edge).

The StreetSegmentCartographer Class

A StreetSegmentCartographer is a Strategy (in the sense of the Strategy Pattern) that a CartographyPanel uses to render StreetSegment objects. It uses a StreetThemeLibrary object to determine the visual attributes of the StreetSegment objects.

The StreetThemeLibrary Class

A StreetThemeLibrary uses the TIGER Road Type Code of StreetSegment objects to determine its color. Specifically, it uses the first character and the last character of the code to determine the visual attributes using the following table:



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Relevant Characters in the Code	Color	Line Width
A1	0, 153, 204	3
A2	102, 153, 204	1
A3	102, 153, 102	3
A4	153, 153, 153	1
A5	211, 211, 211	1
A6	153, 153, 153	1
A7	211, 211, 211	1

Highlighted `StreetSegment` objects must be rendered in 0, 255, 0 with a transparency (i.e., alpha channel) of 128, and a line width of 5.

.str File Format

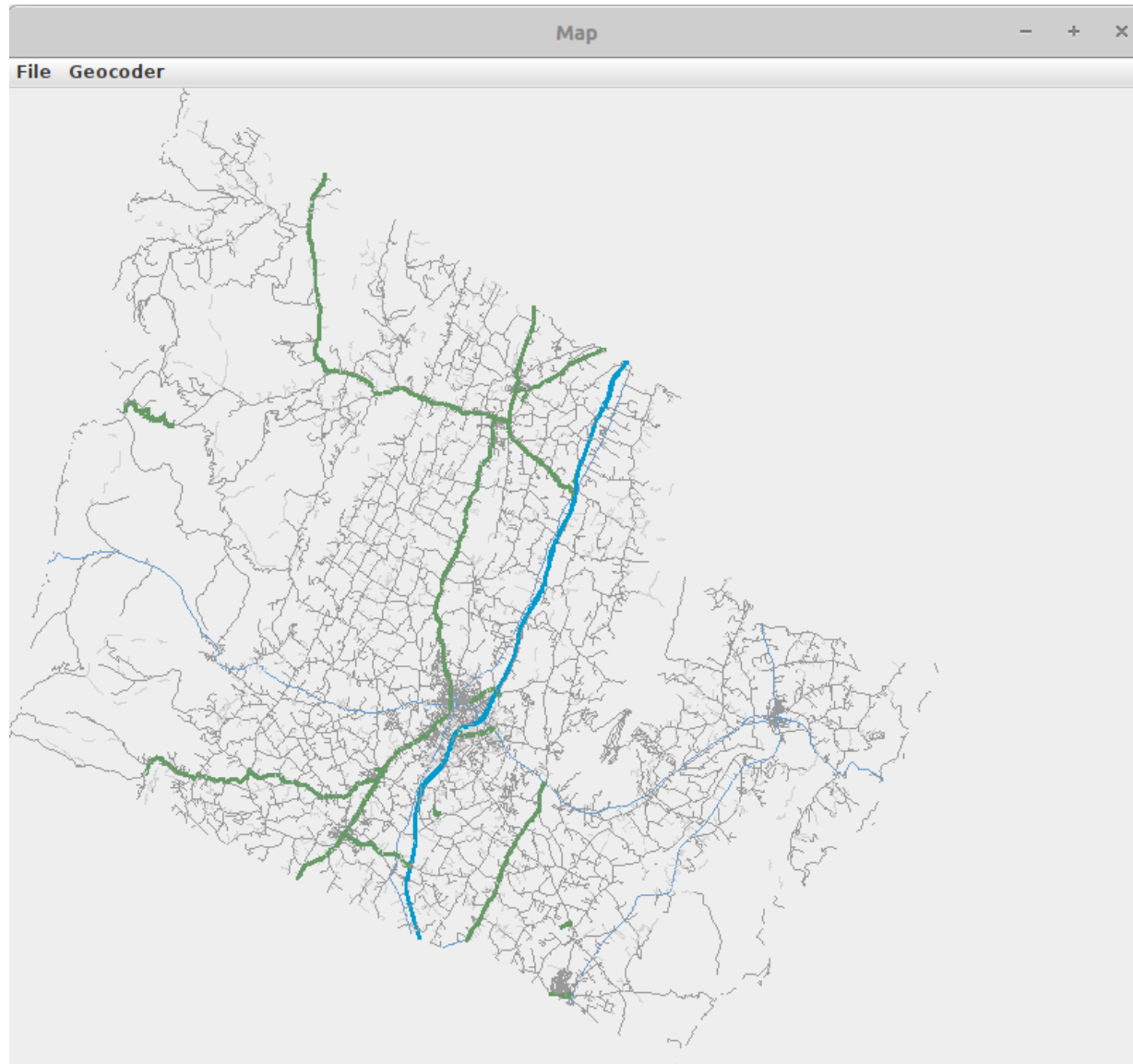
.str files are simple tab-delimited ASCII text files that contain the attributes of `StreetSegment` objects. Each record contains the attributes of a single `StreetSegment` object, and consists of the following fields: Tail Node, Head Node, Length (in KM), TIGER Road Type Code (e.g., A11), Arc ID, Street Prefix (e.g., N), Street Name, Street Type (e.g., Rd, St, Ave), Street Suffix (e.g., NW), Address at Tail Node, and Address at Head Node.

Examples

This section contains examples of what we hope the maps will look like. The first shows the streets in and around Rockingham County, VA with no highlighted segments.



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The second shows part of "Old Town" Harrisonburg, VA with 400 Paul St geocoded.

