Team 5: Traffic Simulator
Input/Output GUI

James DeLoach, John Beutner, Kieran Siek, Dhruvil Shah, Emmanuel Aninye

CS 4624: Multimedia and Hypertext Lab
Mohammad Farag
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Outline

- Problem/Motivation Recap
- Features Implemented (1-5)
- Timeline/Milestones
- Acknowledgements
- References
Problem/Motivation

- Manage simulation input files for INTEGRATION 2.40 traffic assignment/simulation/optimization model
- Simulation input files hard to track by hand
- Simulation input files hard to check for correctness
- Template values for traffic demand
- Build a web GUI to create, edit and manage input files
### QNET Node file

<table>
<thead>
<tr>
<th>Node ID</th>
<th>Y</th>
<th>X</th>
<th>Downstream Node ID</th>
<th>Upstream Node ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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</tbody>
</table>

### QNET Link File

<table>
<thead>
<tr>
<th>Link ID</th>
<th>Node 1</th>
<th>Node 2</th>
<th>Link 1</th>
<th>Link 2</th>
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</thead>
<tbody>
<tr>
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<td>1 20</td>
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<td>2</td>
<td>1 20</td>
<td>1 20</td>
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</tr>
</tbody>
</table>

The diagram illustrates the connections between Node 1 and Node 2 with two links, labeled as Link 1 and Link 2.
### QNET Node file

<table>
<thead>
<tr>
<th>Node ID</th>
<th>State 1</th>
<th>State 2</th>
<th>State 3</th>
<th>State 4</th>
<th>State 5</th>
<th>State 6</th>
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</thead>
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<tr>
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</table>

### QNET Link File

<table>
<thead>
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<th>Target</th>
<th>State 1</th>
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<th>State 3</th>
<th>State 4</th>
<th>State 5</th>
<th>State 6</th>
<th>State 7</th>
<th>State 8</th>
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<th>State 11</th>
<th>State 12</th>
<th>State 13</th>
<th>State 14</th>
<th>State 15</th>
<th>State 16</th>
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</thead>
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</tbody>
</table>
Problem/Motivation

- Manage simulation input files for INTEGRATION 2.40 traffic assignment/simulation/optimization model
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- Template values for traffic demand
- Build a web GUI to create, edit and manage input files
Feature 1: Validation and Meta-validation

- Conditional Parsing of Input Files
- Example of validation (file title field):
  - $0 \leq \text{(title length)} \leq 300$
- Example of meta-validation (Number of lanes blocked):
  - $0 \leq \text{Num Blocked (In Incident File)} \leq \text{Num Lanes (In Link File)}$
Feature 2: Form Input

- Separate sections for each file
- Allows for uploading a file or creating a new one
Feature 3: Validation GUI

- Fields are validated and any errors are shown inline
- Files must validate before saving
Feature 4 - Saving of Files to Backend

- Each “input package” has a UUID
- SQLite database stores names and modification times

```
fbccc64f-c377-4dc7-b991-4604284fc861
├── input
│   ├── demand.dat
│   └── incidents.dat
├── link.dat
└── node.dat
     └── signal.dat
Signal.int
```

Select traffic simulator input package

- Test
- Last Modified: 11/11/2023, 12:11:17 PM
- Edit  Download  Copy

- Test 2

New Package
Feature 5 - Templating of Demand File

- Traffic demand between different points
- Important feature for client
- Templates are stored in the SQLite database
- When downloading, the GUI substitutes in the values
  - All the different versions are included in the zip file

Input_package.zip

```
├── input
│   ├── demand_0.0.dat
│   ├── demand_0.5.dat
│   ├── demand_1.0.dat
│   └── incidents.dat
│       └── link.dat
│           └── node.dat
│               └── signal.dat
│                   ├── Signal_0.0.int
│                   └── Signal_0.5.int
|                   └── Signal_1.0.int
```

Demand Templates

<table>
<thead>
<tr>
<th>DEMAND LINE</th>
<th>VEHICLE CLASS</th>
<th>START</th>
<th>END</th>
<th>STEP</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>0</td>
<td>1</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Add
Next Steps

1. Deploy to internal server
2. Ensure functionality of deployed server
3. Finish Report
Acknowledgements

- Professor Mohamed Farag
- Michel Van Aerde (not pictured)
- Hesham A. Rakha, Ph.D
“Mohamed Farag.” *Virginia Tech Transportation Institute*,

Rakha, Hesham A. “Software.” *Hesham A. Rakha*,
[https://sites.google.com/a/vt.edu/hrakha/software?authuser=0#h.p_PFphBsAJ3l60](https://sites.google.com/a/vt.edu/hrakha/software?authuser=0#h.p_PFphBsAJ3l60).
Image Citations

https://www.vtti.vt.edu/staffdir/bio.php?&pn=04208

https://sites.google.com/a/vt.edu/hrakha/home