

Mobile Mapping and Personal Driving History

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Route Choice Matters

- Average driver spends a full week each year stuck in traffic.





How do we decide?

➡ Resources

- Websites
- Traffic reports
- Traffic management systems
 - Focus on estimated travel time
 - Discrete sensors
(i.e. cell phones, GPS, cameras)
- Personal experience

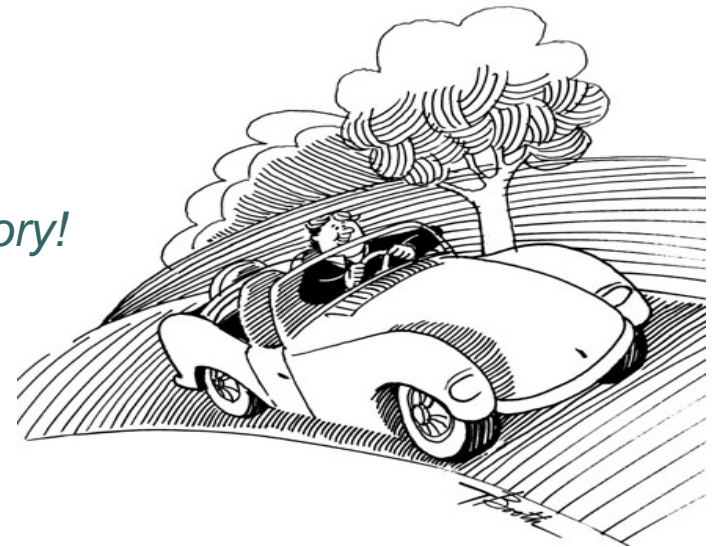
How do we decide?

- Resources

- ➡ Personal experience

- Try different routes and choose the one I like the best

Aha! Build a system based on driving history!





A Driver-Centric Approach

- Decentralized data collection
 - Individuals record statistics while driving
- Pattern detection
 - Spot patterns in summary information
- Custom annotation
 - Enrich the data with personal notes
- Community and collaboration
 - Fill in gaps by aggregating data from the broader community



Web Survey



- 292 respondents
 - 67% female, 53% between 46-60, 92% from US
- Is this a good idea?
 - **Many people do not know the best route**
 - **58% spend time arguing which route is "best"**
 - **79% say a personalized system for choosing routes would be useful**

“The number of reasons this would be useful to so many people are too numerous to count here”



Web Survey



- What are the right tasks?
 - Find the best route
 - Find the best time to leave
 - See which way other people go
 - Add my own notes to routes
 - Find points of interest near a route
 - Find similar routes
 - Get directions for my common routes
 - View real-time traffic information

“Tell me the gas station with the lowest price along the route”

“Provide suggestions for similar trips in other areas”

“I’d love to be able to specify a start point and end point and the amount of time I am willing to take”

Web Survey



- What do people care about when choosing a route?

- Measurable attributes

- Distance
 - Travel time
 - Time stopped
 - Number of stops
 - Driving speed

“Overall, the fastest way is the best way”

- Other attributes

- Scenery
 - Nearby locations
 - Types of roads
 - Road conditions
 - Fuel consumption
 - Safety

“I don’t like back-winding routes that make me carsick”



Web Survey



- Are people willing to share their data?
 - 75% willing to share at least some data

“I’d share anything if it were people that I could choose”

“I would be willing to share the routes I think are best”

- But privacy is a concern

“I would share any information that I did not classify as personal”

“I would not want criminals to have access to when I would not be home”

An Early Prototype

○ RouteLens

➡ Mobile Interface

- Runs on
 - PDAs and phones
(with GPS receiver)
- Lets users
 - Records trips
(time, position, speed)

● Desktop Interface



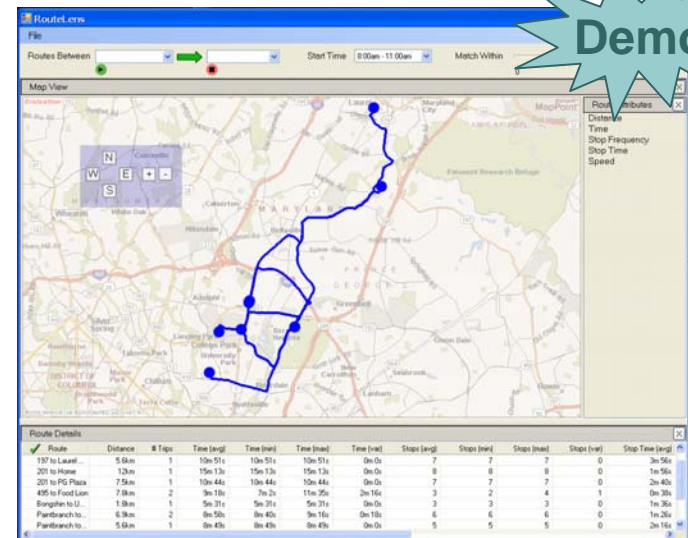
An Early Prototype

RouteLens

- Mobile Interface

➡ Desktop Interface

- Runs on
 - Windows PC
- Lets users
 - Import trips
 - View routes
 - Compare routes



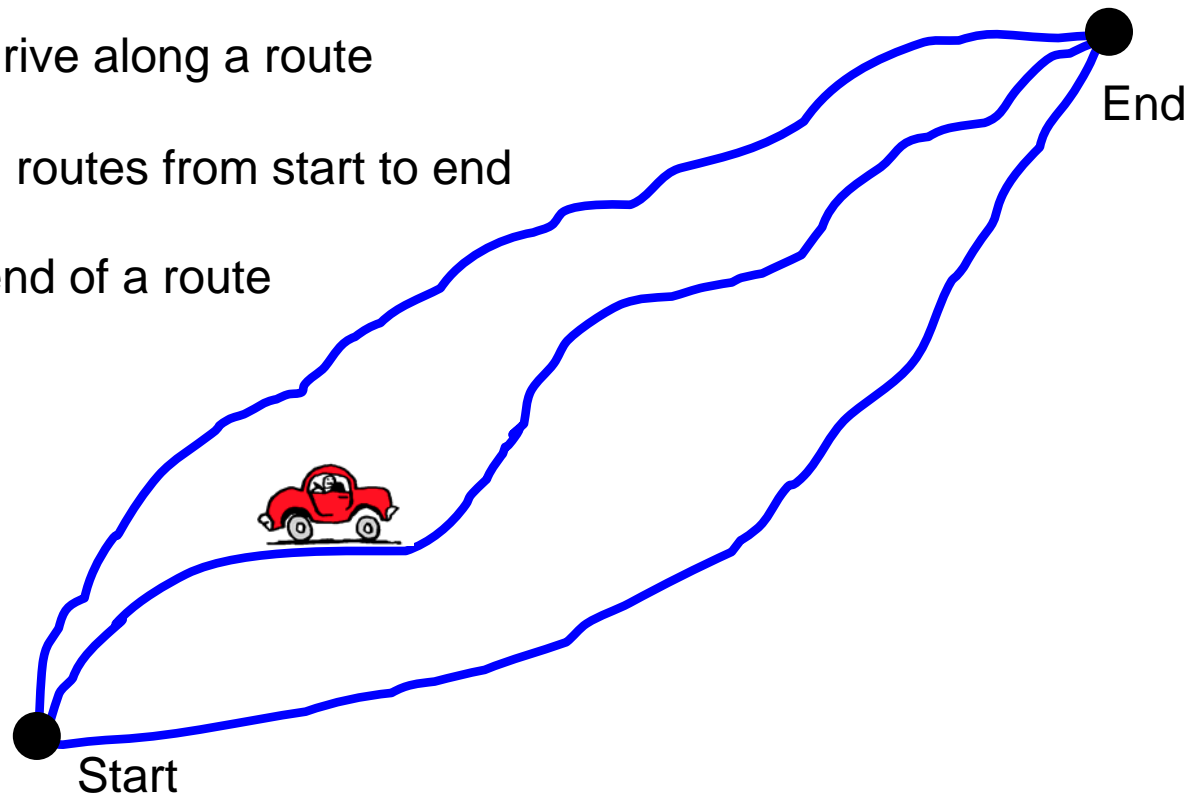
Understanding the Data

Route: Set of roads from start to end

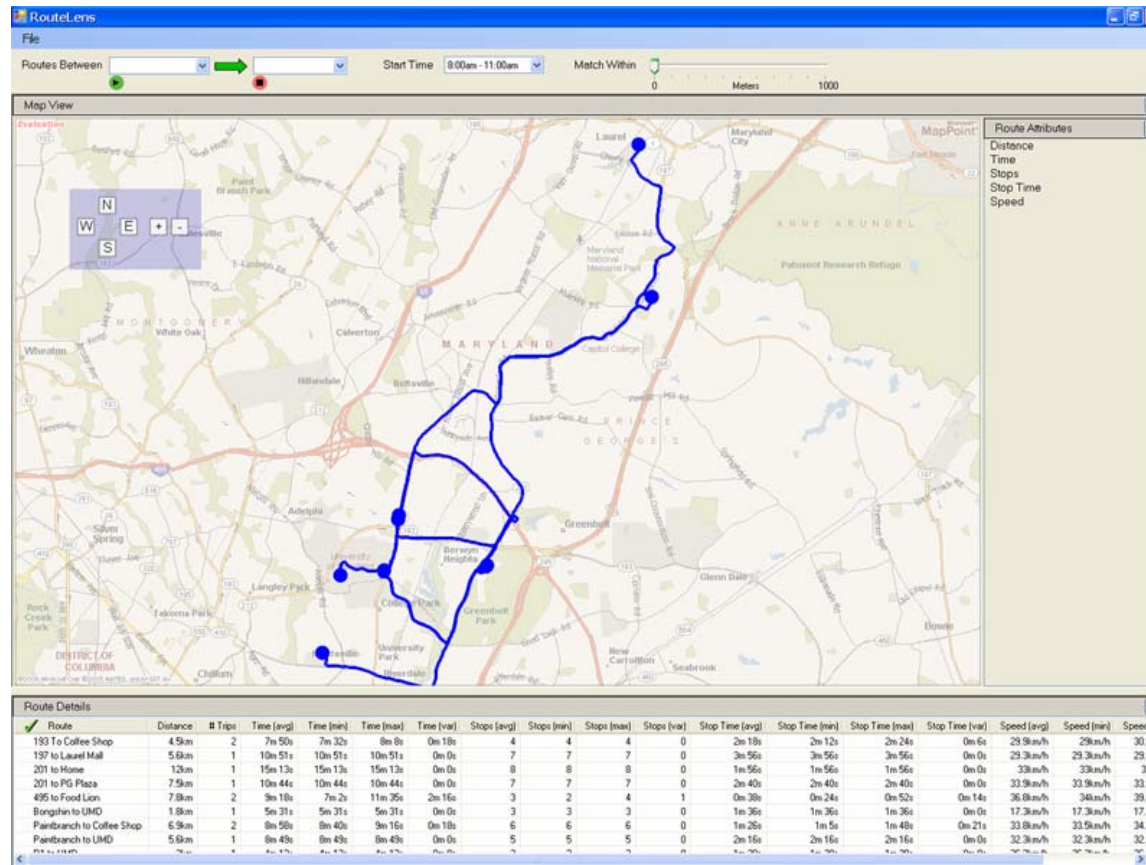
Trip: Each time you drive along a route

Route Collection: All routes from start to end

Location: Start and end of a route

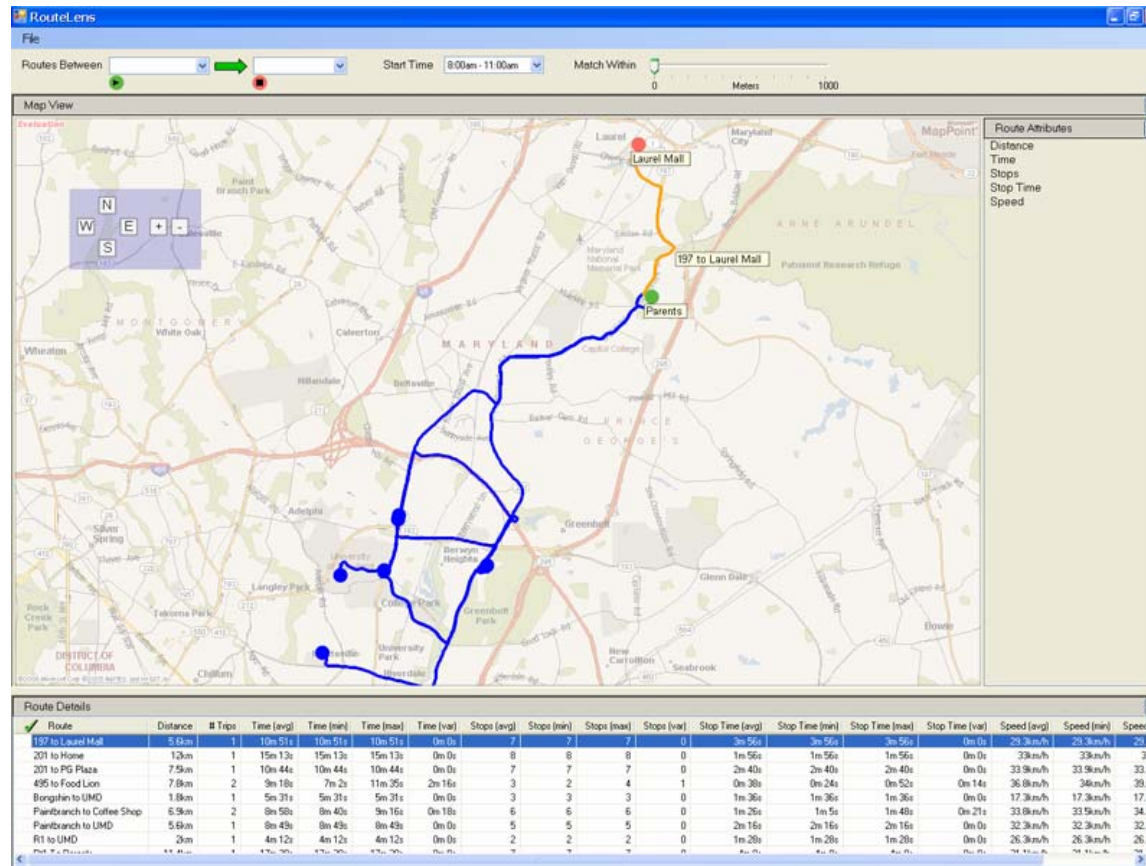


Demo



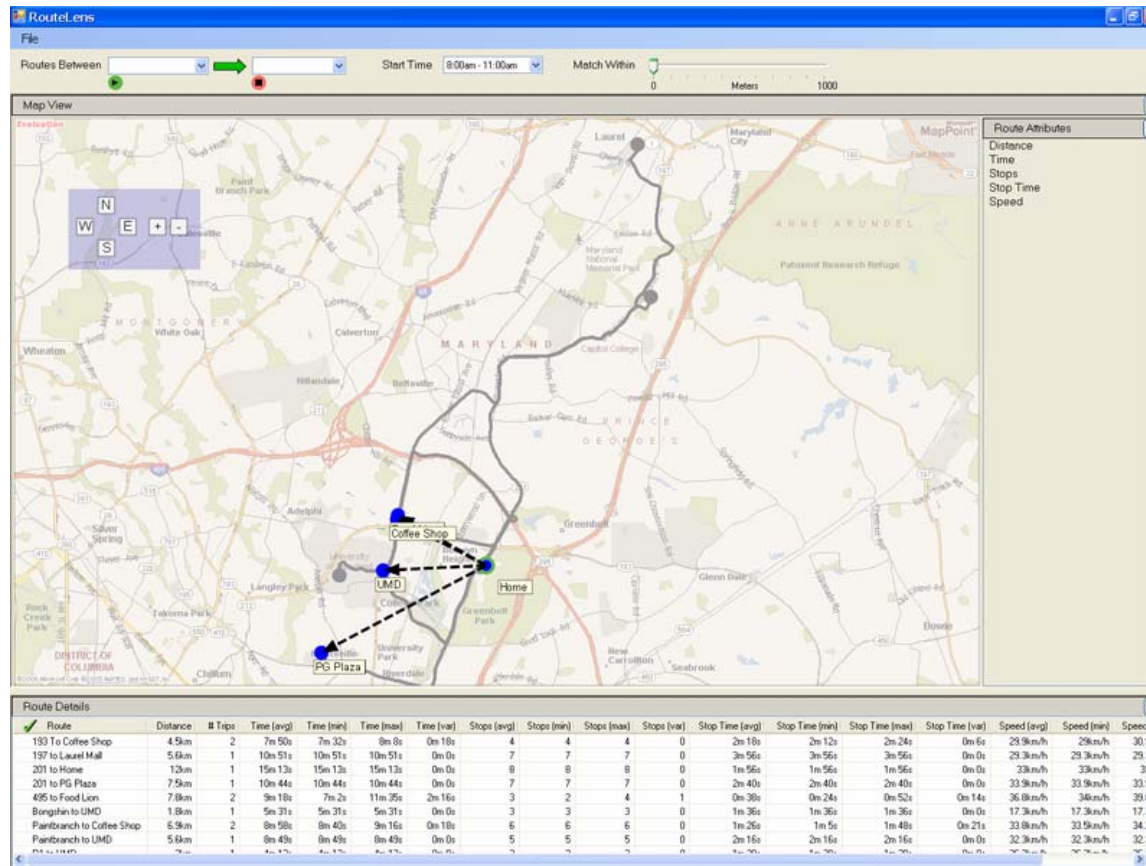
View routes

Demo



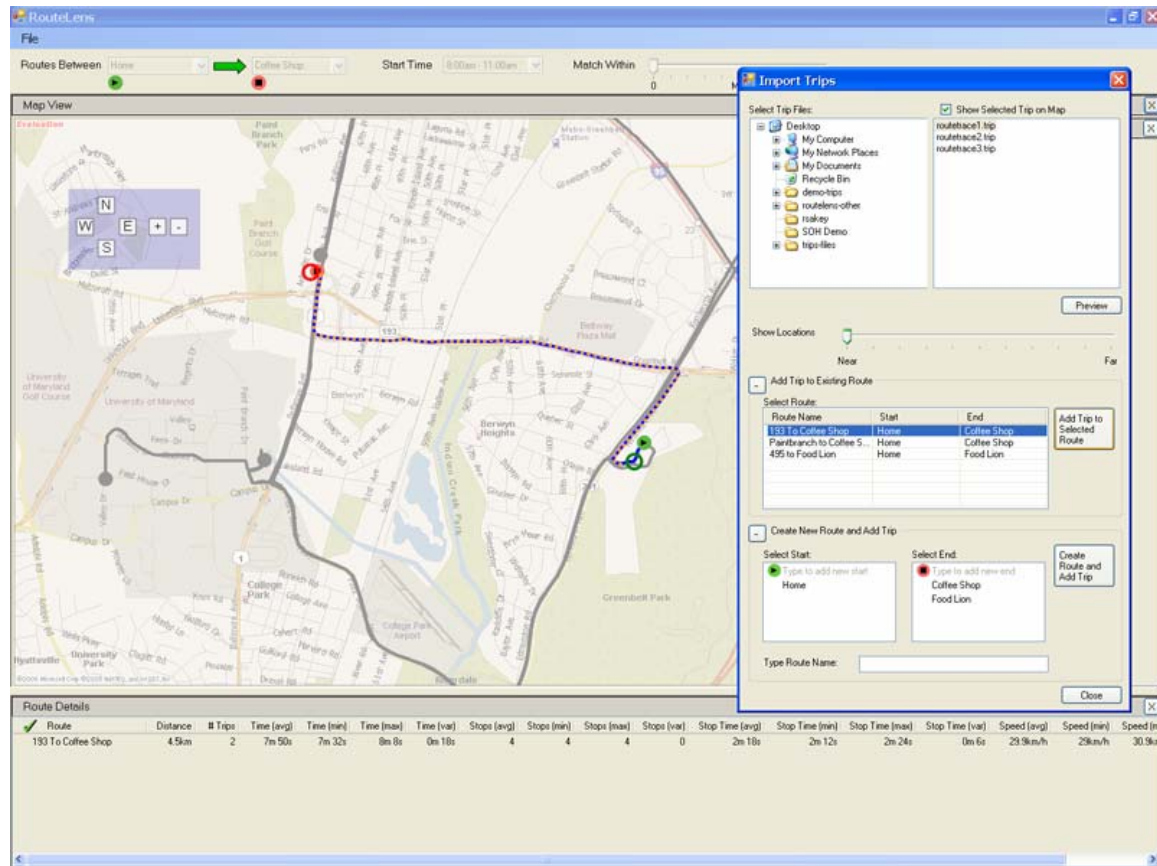
Highlight routes

Demo



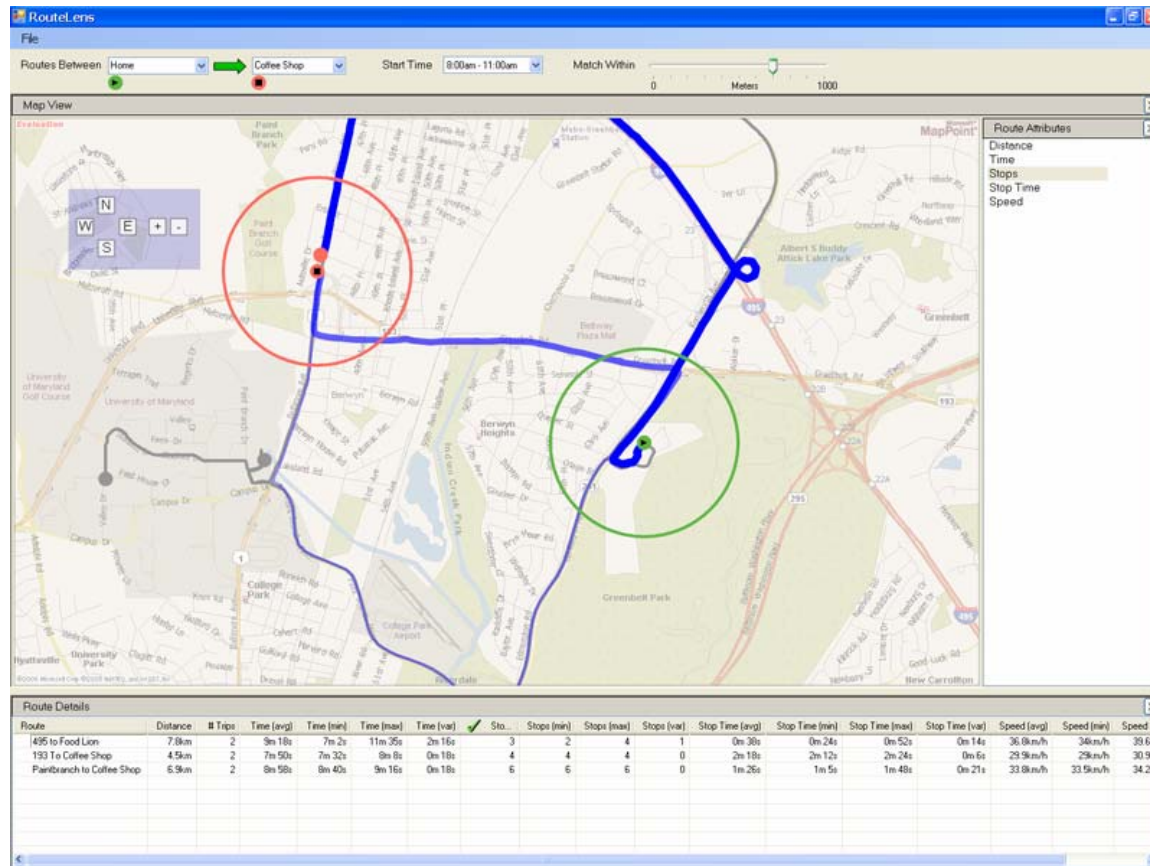
Highlight locations

Demo



Import trip files

Demo



Find the best route



Next Steps

- Support many more tasks
 - Annotation and sharing
 - Generate directions
 - Find similar routes
 - Compare drivers
 - Remember where you went
 - View traffic incidents
- Technical challenges
 - Aggregate / merge similar routes
- Build mobile visualization

Thanks

Understanding your personal driving history can help you and help others!



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www.cs.umd.edu/hcil/routelens