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

*Ah! 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”
What do people care about when choosing a route?

- **Measurable attributes**
  - Distance
  - Travel time
  - Time stopped
  - Number of stops
  - Driving speed

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

"Overall, the fastest way is the best way"

"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
Highlight routes
Demo

Highlight locations
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