TRANSDEC: Transportation Decision Making

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Agenda
- Project Overview
- System Architecture
- Tasks
- Technical Background
- Plan

TransDec
- TransDec: a real-data driven and immersive framework that enables on-the-fly spatio-temporal querying, analysis and planning of transportation systems
  - Two main focus
    - Moving objects
      - Nearest Neighbor
      - Range Queries
      - Geofence
      - Historical Playbacks
      - Traffic sensors
      - Continuous Monitoring
      - Historical Traffic Patterns
      - TD Shortest Path
  - Historical Playbacks
  - Real-world spatiotemporal data

Traffic Sensor Data
- Provided by RIITS
  - Real-time highway congestion
  - Real-time arterial congestion
  - Events
  - Metro Bus & Train locations
  - CCTV
- Highway sensors spread over 18 highways inside LA
- Total 1523 highway sensors covering 1183 miles
  - Update rate every 1 minute
    - Daily 2.2 million rows, 300MB of data (only highway sensors)

Moving Objects
- Provided by USC Transportation office
  - 40 Vehicles
  - Update rate is every 5 seconds
  - Moving object trajectory lat/long, speed

System Architecture
- RIITS
- Web Services
- Archive
- Quality Engine
- Target
- Google Maps
- MS VE
Tasks

- Real-time data integration from RIITS
  - Traffic sensor data for main streets
  - CCTV
- Generic query interface „Middle-Tier”, implementation that enables structured information exchange
- Porting TransDec (traffic sensor visualization and querying) to ArcGIS
- Documentation and workshop paper

Technical Background

- Oracle Spatial – PL/SQL
- AJAX, Flex
- Java- Servlet, Jsp
- SOAP, XML, WSDL

Plan

- Data Collection: 1-3 Weeks
- RIITS Integration: 4-7 Weeks
- Middle Tier Development: 7-10 Weeks
- ArcGIS Development: 10-12 Weeks

- Weekly meetings
- Milestones & Progress

Why is this project existing?

- If you plan to pursue PhD
  - Numerous research challenges that you can pick
  - Real dataset: easy to motivate and run experiments
- If you plan to work in Industry
  - Great for your resume: state-of-the-art architecture, programming languages and tools
  - Big companies (e.g.: Google, ESRI) are already interested in such projects