Intelligent Tourist Guiding Service Based on Smart-M3 Platform

Alexander Smirnov, Nikolay Shilov, Alexey Kashevnik, Nikolay Teslya, Maxim Shchekotov

Laboratory of Computer Aided Integrated Systems
St. Petersburg Institute for Informatics and Automation of Russian Academy of Science (SPIIRAS)
Table of Contents

- Motivation
- Intelligent Tourist Guiding Service
  - Tourist Attraction Information Service (TAIS)
  - Service for Planning Routes Based on Public Transport Schedule
  - Ridesharing service
  - Taxi Calling Service
- Conclusion & Future Work
Motivation

- Transportation Problem in Russian Small Cities
  - Lack of public transport in small cities
  - Taxi drivers usually do not understand foreign languages

- How to Provide Tourist with Needed Information?
  - Up-to-date information about attractions
  - Navigation in museums
  - Planning the attractions attending plan based on current situation in the region
Intelligent Tourist Guiding Service

Location
Preferences

Tourist Guiding Core KP

Communication based on Smart-M3 platform

Routing KP
Attraction Information KP
Current Situation Acquisition KP

Suggestions
General Architecture of Intelligent Tourist Guiding Service

Tourist Guiding Core KP

Tourist Context

RDF Ontology

Extra KPs

Information Acquisition KP

Routing KP
- Public Transport
- Ridesharing
- Taxi

Current Situation Acquisition KP

Positioning KP

Tourist Profile

Tourists

Smart Space

SSAP
Tourist Profile

Context Information
- Location
- Time
- Weather
- Traffic situation

Long-Term Information
- Role
- Preferences
  - Trip length
  - Interaction mode
  - Types of attractions
  - Preferable attractions
  - Transportation means
Attraction Information KP
General Scheme

Location
Preferences

Attraction Information KP

geo2tag

wikimapia
Panoramio
flickr

Wikipedia
WikiLocation
Wikivoyage
Attraction Information KP as a Separate Service

The service automatically determine tourist location.

The tourist can see attractions in another locations.

It is possible to search attractions.

Your current location is Saint Petersburg.
Langitude: 59.95 Longitude: 30.316667

Choose a region
Karelia

Choose a city
Petrozavodsk

Search an attraction
Petrozavodsk

Petrozavodsk Attractions

Спартак (стадион, Петрозаводск)

Проспект Карла Маркса (Петрозаводск)

Нежский тракторный завод

Храм Божией Матери Неустанной Помощи (Петрозаводск)

Карельская государственная филармония

Карельский театр кукол
Карельская государственная филармония — государственная филармония Республики Карелия, крупнейшая и старейшая концертная организация республики. Здание филармонии, построенное в 1984 году, расположено в центре Петрозаводска, на улице Кирова. У филармонии один концертный зал — Большой концертный зал в котором 481 место, из них 103 расположены на балконе.
Routing KP

- Location
- End Point
- Preferences

Routing KP

- Taxi
- Public Transport
- Fellow-Travelers

Communication based on Smart-M3 platform

- Taxi Calling KP
- Public Transport Schedule Yandex.Schedule
- Ridesharing Service
Public Transport Schedule in Karelia Region

- Negotiations with Yandex.Schedule representatives result in XML file with schedule of all public transport in Karelia republic

```xml
<stations>
  <station>
    <id>0</id>
    <name>Central station</name>
    <latitude>61.789661</latitude>
    <longitude>34.353433</longitude>
  </station>
</stations>

<transportation_facility_types>
  <type><id>0</id><name>Bus</name></type>
  <type><id>1</id><name>Train</name></type>
  <type><id>2</id><name>Plane</name></type>
  <type><id>3</id><name>Ferry</name></type>
</transportation_facility_types>

<costs>
  <cost><departure_station>0</departure_station><arrival_station>1</arrival_station><type>1</type><cost>30</cost></cost>
</costs>

<transportation_facilities>
  <transportation_facility>
    <id>b_1</id><type>0</type><route_number>10</route_number>
    <route>
      <station><id>0</id><arrival_time>10:20</arrival_time><departure_time>10:22</departure_time><next_station><id>1</id></next_station></station>
      <station><id>1</id><arrival_time>11:20</arrival_time><departure_time>11:22</departure_time><next_station><id>null</id></next_station></station>
    </route>
  </transportation_facility>
</transportation_facilities>
```

- The information has been imported to PostgreSQL database
- The service for providing a tourist with information how to reach an attraction by public transport is under developing
The Main Idea of Ridesharing Service
Ridesharing Service Architecture

Smart Space

Driver 1
Android App
SSAP
Attraction 1

Driver n
Android App
SSAP
Attraction n

Tourist 1

Tourist m

Information Broker 1
SSAP

Information Broker n
SSAP
Android-Based Client Modules for Ridesharing Service

Java Development Kit
Java Library for Smart-M3
Taxi Calling KP

Location
Preferences

Taxi Calling KP

Taxi phone
Price

Communication based on Smart-M3 platform

Information about Taxis in a Region
Taxi Calling KP as a Separate Service
Conclusion & Future Work

- The main difference of the proposed approach from existing guiding services and solutions is using of mechanisms for on-the-fly information acquiring from different sources.
- The presented information model of tourist profile allows to keep and utilize by the service useful information about the tourist.
- Tourist attraction information service and ridesharing service will be shown during the Demo Section of FRUCT conference.
- Negotiations with Yandex.Schedule Representatives result in XML file with all public transport schedule in Karelia republic.
Thank you for Attention
Questions are Welcome

St. Petersburg, Russia, E-mail: alexey@iias.spb.su