Call for Proposals

LBS & GIS

HIRP OPEN 2017

Application Deadline: 09:00 A.M., 16th June, 2017 (Beijing Standard Time, GMT+8).

If you have any questions or suggestions about HIRP OPEN 2017, please send Email (innovation@huawei.com). We will reply as soon as possible.

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HIRPO2017190501: Map merging and updating of high-precision relative positions in a global coordinate system

1 Theme: LBS & GIS

2 Subject: GIS

3 Background

A relatively high-precision map collected by scenario is a high-precision local map in a relative coordinate system, which can be expressed as relative positions in a location. Such relative positions are expressed in a low-precision coordinate system with an error of 10 m, though. Therefore, position data collected by multiple vehicles in different batches must be matched to identify clutter changes so as to accurately express the relative positions on a scenario-specific map. Then merge the same object's geometry by different maps. Add or edit the new object into map data.

4 Scope

High-precision Map

5 Expected Outcome and Deliverables

It is expected to make achievements in the following aspects:

1. Matching of relative positions obtained by a sensor in different batches

2. Fitting of geometrical features of high-precision relative positions

3. Refined update of map elements of high-precision relative positions on scenario-specific local maps

6 Acceptance Criteria

1. The error of relative positions after map joining is smaller than that during data collection.
2. Map data can be updated in real time by map or map element.
3. The automation rate reaches 95% at minimum.

7 Phased Project Plan

Phase1 (~3 months): Match scenario-specific local map data collected in different batches.
Phase2 (~5 months): Identify clutter changes.
Phase3 (~4 months): Update scenario-specific local maps.

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HIRPO2017190502: Composing a high-precision map using point clouds from camera and low-precision location sensors

1 Theme: LBS & GIS

2 Subject: GIS

3 Background

High-precision maps are produced by laser radar sensors and D-GPS. The data processing is complex. Map production's cost is high. And the usage of D-GPS has legal restrictions in some scenarios. In order to produce a high precision map. We need explore how to compose a high-precision map using point clouds from camera and make breakthroughs in algorithms to enable less dependency on the data accuracy of sensors.

4 Scope

High-precision Map

5 Expected Outcome and Deliverables

It is expected to make achievements in the following aspects:

1. Processing algorithms of point clouds in anti-distortion, noise reduction, and 3D modeling

2. Building of geometrical vectors

3. Object extraction and semantic assignment

6 Acceptance Criteria

1. The horizontal error is smaller than 20 cm.

2. The composition automation rate reaches 90% at minimum.

3. The overall work efficiency is greater than 10 km per person day.

7 Phased Project Plan

Phase1 (~3 months): Extract the objects' geometry.

Phase2 (~5 months): Recognize the feature's significance.

Phase3 (~4 months): Product the High-precision map.

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HIRPO2017190503: Radio location algorithm research and development

1 Theme: LBS & GIS

2 Subject: Indoor positioning by matching radio waves

List of Abbreviations

LBS: Location-based service

3 Background

LBS is an important network service in mobile application. With improve of the mobile phone, more and more applications will use location service. These apps require high precision, low power consumption and low latency location technology. The same time, location services cannot rely on high device costs, it is best to use existing radio signals.

4 Scope

Research on location algorithm by radio signals: such as Wi-Fi signal, cell signal, geomagnetic signal, or other signals, design location implementation scheme for outdoor and indoor.

5 Expected Outcome and Deliverables

Technical reports of location algorithm by radio signals;

Technical reports of location algorithm solution design, including finger print database design and algorithm design;

Implementation effect, location precision, power consumption, performance;

1~2 Invention/patents;

6 Acceptance Criteria

Project proposal is accepted by the evaluation team, Huawei.

Project deliverables are accepted by the evaluation team, Huawei.

Outdoor location precision < 20 meters, Indoor location precision < 3 meters (HUAWEI mobile phone as the test standard)

7 Phased Project Plan

Phase1 (~2 months): survey the state of the radio location technology in mobile phone field, provide the related technical analysis report.

Phase2 (~2 months): provider radio location design solution, with effective algorithm which can solve the location accuracy requirement.

Phase3 (~3 months): provide related algorithms, simulation results and patents

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