



Virtual Telescope and Stars Guide service for mobile devices (Progress report)

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Outline



1. Motivation
 2. Use-case scenarios
 3. Underlying technologies
 4. Mathematical part of service
 5. 3 Demo
 6. Current project stage and future plans
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Motivation



- Fulfill people's aspiration to know more about our universe
 - Provide access to the best astronomical content without special astronomical tools
 - Astronomical service available at any time and any place by means of mobile device
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Use-case scenarios

Starpedia

Access to the map of stars observable in the given time and location and information about sky objects (name of constellations, stars, etc.)



Stars-identifier

Gets the starpedia page that corresponds to the area of sky to which the device camera is pointing in the given moment of time



Virtual Telescope

Gets real pictures of the sky object in scale and for area defined by the user → the virtual telescope experience



Underlying technologies



The services require that the device has:

- Accelerometer sensor
- Compass sensor
- Internet connection

The following optional elements are useful:

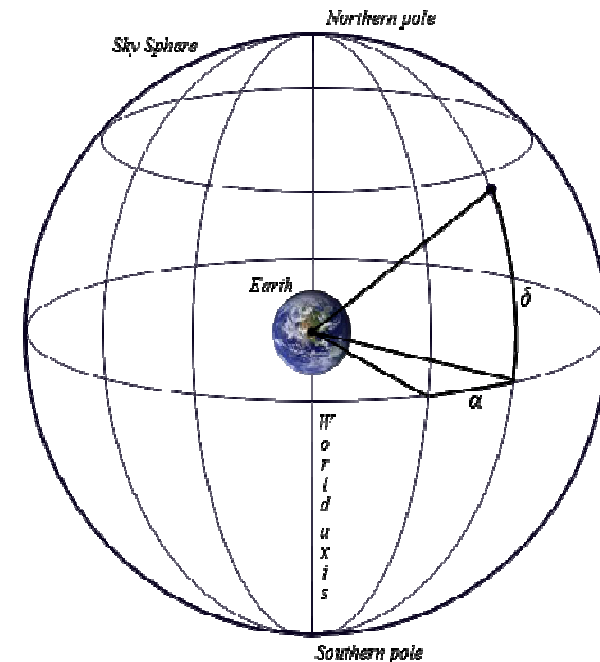
- GEO-positioning module (GPS)
 - High resolution digital camera
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Mathematical part of service



3 steps of sky-requested coordinates calculation:

1. Transformation of user coordinates to format Ra and Dec (α and δ)
2. Taking into consideration the angle of inclination of the mobile device
3. Taking into consideration the angle between north and a direction on which the user is pointing

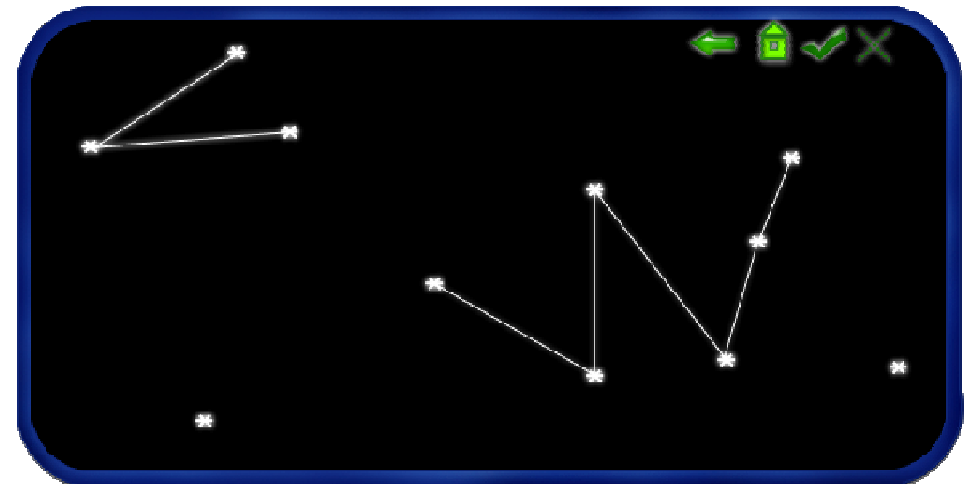


First demo



User inputs
coordinates of the
center of area of the
star sky and get
corresponding
scheme of stars.

A screenshot of a user interface for inputting coordinates. It features a light blue background with rounded corners. At the top left, there is a label "Latitude:" followed by a white text input field and a small blue dropdown menu. Below this is a label "Longitude:" followed by another white text input field and a similar blue dropdown menu. To the right of the longitude dropdown is a small white box containing the letters "W" and "E" stacked vertically. On the right side of the interface, there is a 3D globe of the Earth with a green arrow pointing down towards it. Above the globe are three small green icons: a left-pointing arrow, a house icon, and a close 'X' icon. At the bottom center, there is a prominent green button with the text "OK" in black.



First demo



Qt Designer for
interface

ESO HST Guide
Star Catalogue
as DB of stars
coordinates

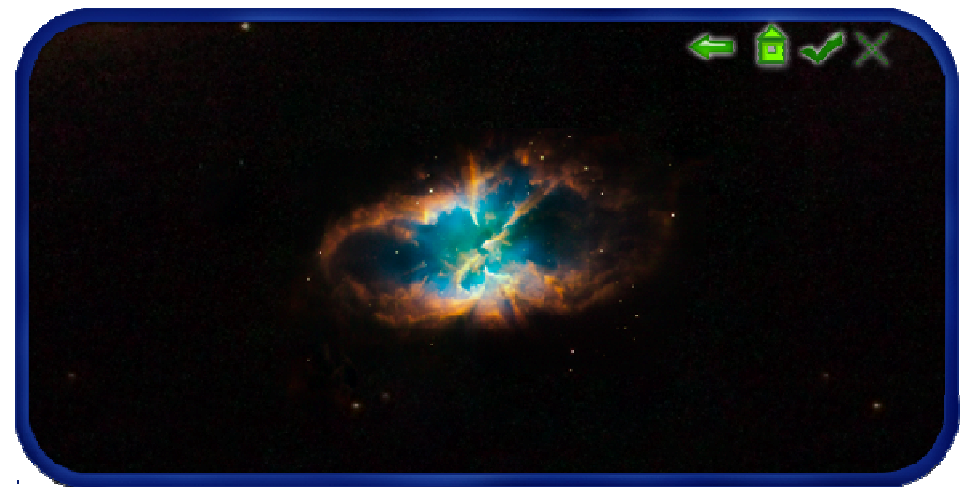


QNetworkAccessManager
for connection to Internet

Second demo



User inputs
coordinates of the
center of area of the
star sky and get
corresponding real
image of the visible
stars

A blue rounded rectangular form with a light blue background. It contains two input fields: 'Latitude:' and 'Longitude:'. Each field has a white text box and a small blue dropdown arrow to its right. Below the 'Longitude:' field is a white box containing the letters 'W' and 'E' stacked vertically. To the right of the form is a globe icon with a green arrow pointing down. At the bottom is a green 'OK' button. In the top right corner, there are three small icons: a left arrow, a house, and an 'X'.

Second demo

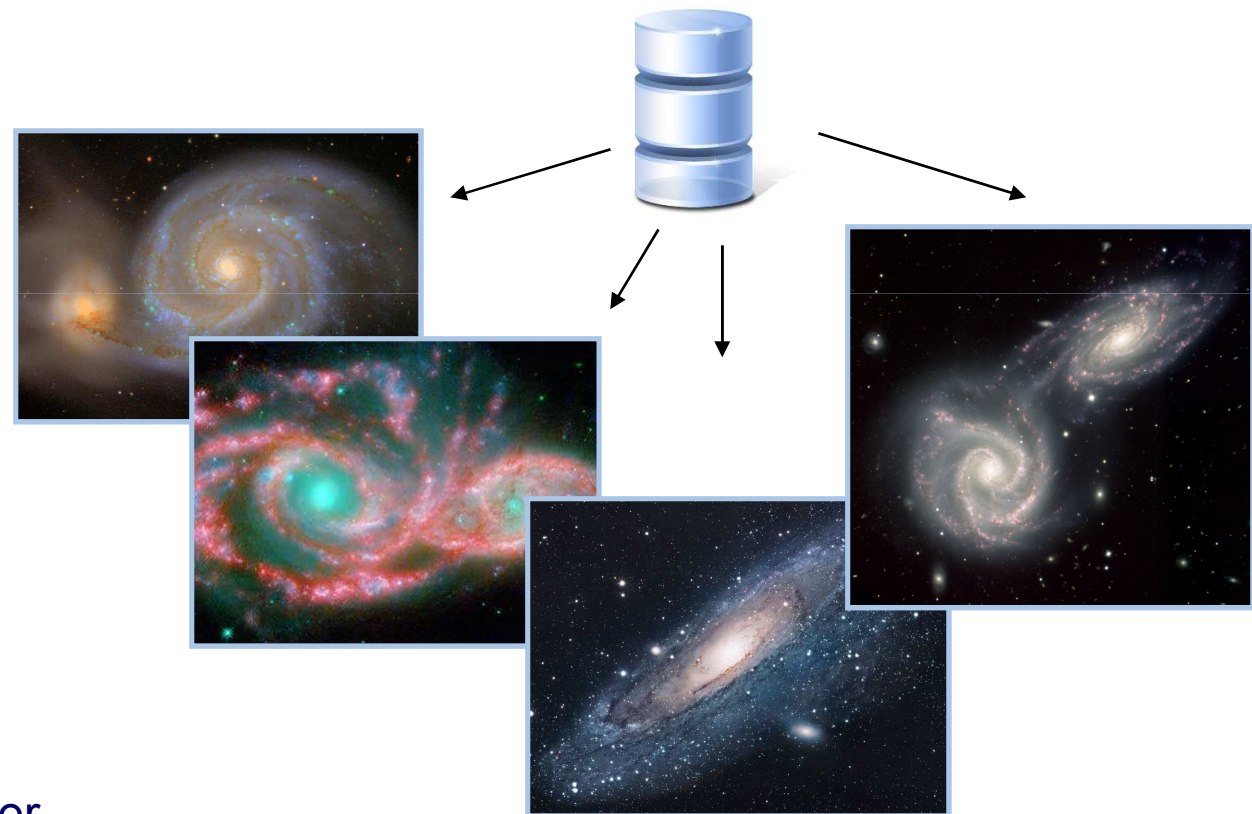
Data from SDSS telescope for access to real images of the star sky (<http://www.sdss.org/>)



Qt Designer for interface

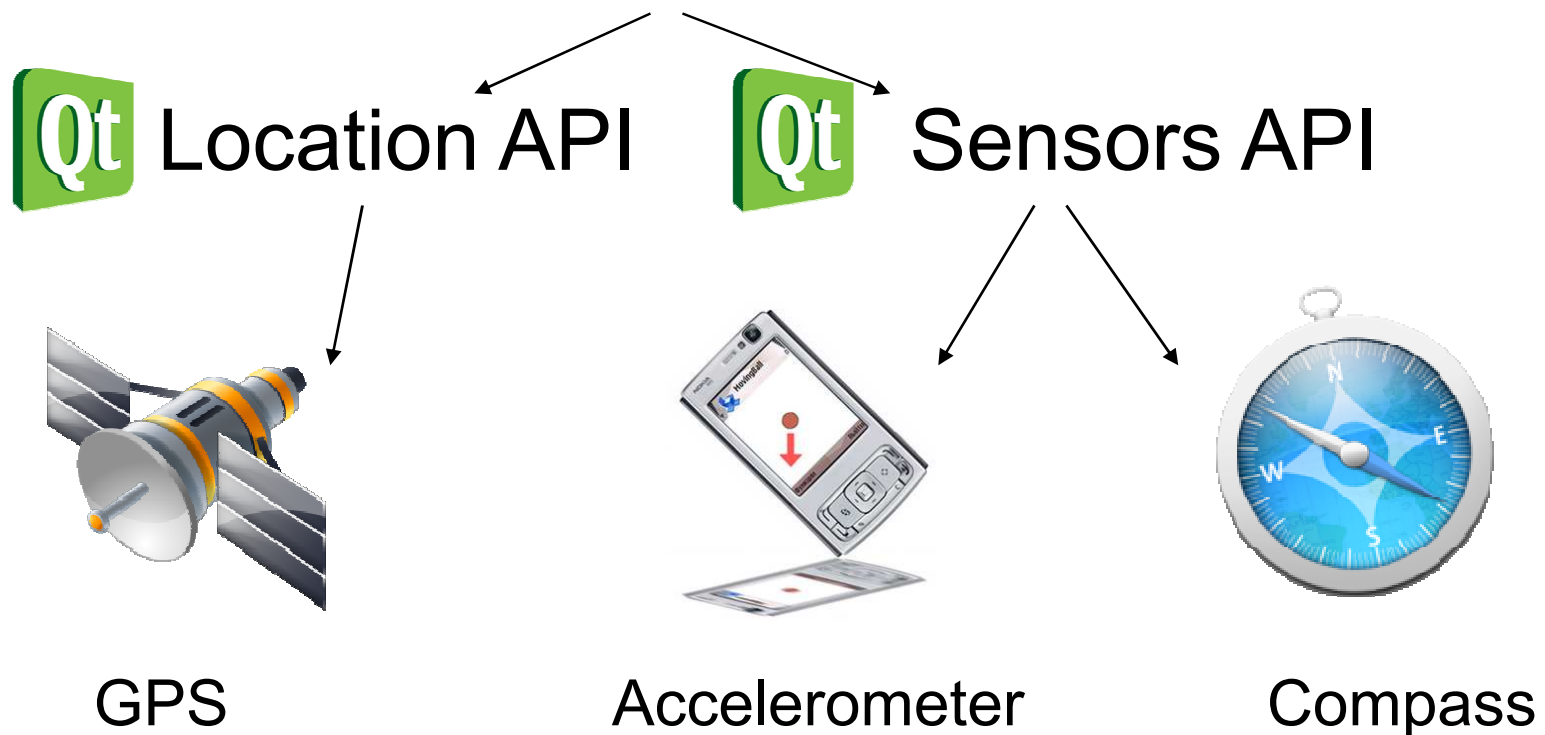


QNetworkAccessManager for connection to Internet



Third demo

Getting data from sensors of mobile device and transforming its to the system of sky coordinates (Ra and Dec)



Results and future plans



Now project in the stage of realization of demo

What has been done:

- Basic service requirements are defined
- The service architecture is defined
- Mathematical model is developed
- First demo is created, second demo in the stage of realization

To be done next:

- Continuation of demo development
- Union of 3 demo into the whole application
- Testing of application



Thanks for your attention!

For more information visit:

<http://www.fruct.org/vt>