

May 23-24 | Florence, Italy

# State of Qt Location

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# Outline

- Overview
- 5.9: infrastructure redesign
- 5.10: usability improvements
- 5.11: turn-by-turn navigation API
  - + improved support for navigation engines
- 5.12 and beyond

# (Mini)-Overview

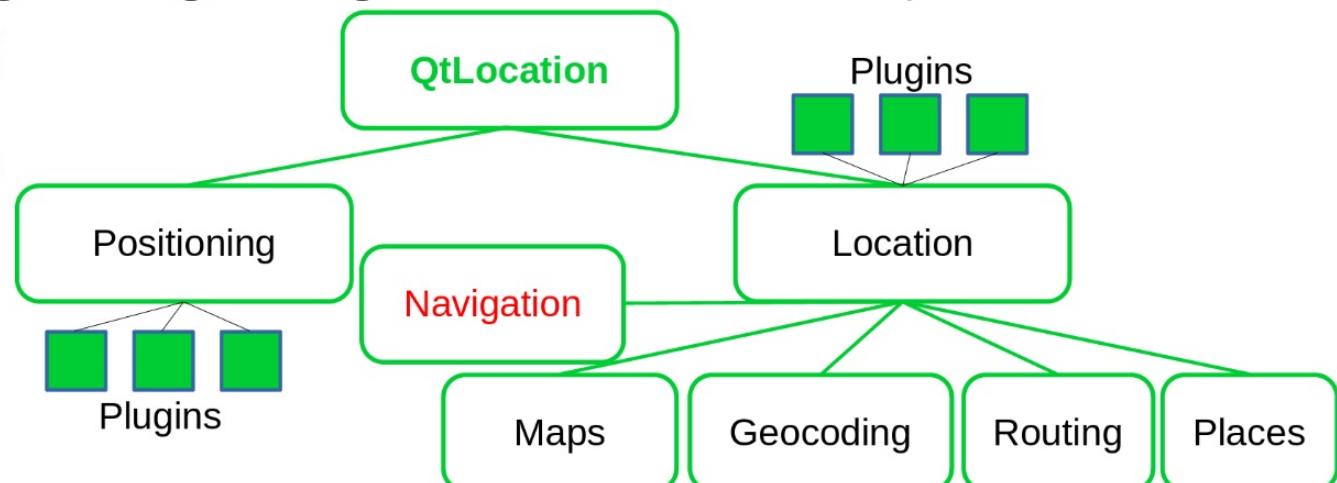
- Organized in 2 submodules: **Positioning** and **Location**

- **Positioning**

- C++ and QML api to retrieve the current position
- On Linux, WinRT, Android, MacOS, iOS and serial NMEA

- **Location**

- C++ and QML api for geocoding, routing, and Pol search and manipulation
- QML API for mapping
  - Display maps
  - Add (interactive) content
    - Programmatically
    - From a model



# Positioning plug-ins

Name	Position	Satellite	Area Monitor	Notes
Android	yes	yes	yes	No GMS
iOS	yes	no	no	uses CoreLocation
MacOS	yes	no	no	uses CoreLocation
WinRT	yes	no	no	
Gypsy	no	yes	no	for Linux, abstraction layer
GeoClue	yes	yes	no	for Linux, Gnome's QtPositioning
PositionPoll	no	no	yes	fallback for area monitoring
NMEA	yes	no	no	has replay mode

# Geoservices overview

Name	Mapping	Geocoding	Routing	Places	Notes
osm	yes/yes	yes/no	yes/no	yes/no	uses OSRM for routing, Nominatim for geocoding and places
esri	yes/no	yes/no	yes/no	no/no	needs token for geocoding and routing
here	yes/no	yes/no	yes/no	yes/no	needs token for everything
mapbox	yes/no	yes/no	yes/no	yes/no	needs token for everything
mapboxgl	yes/yes	no/no	no/no	no/no	uses custom renderer
itemsoverlay	no/no	no/no	no/no	no/no	provides an empty map to overlay items

# Built-in map renderer

- Smooth zoom
- Supports hi-dpi tiles
- Mip-mapping and anisotropic filtering
- Can rotate and tilt the map
  - and change the field of view
- Uses a tile cache
  - default implementation file-based
  - three-levels of cache: disk, memory, texture
  - 2 cost functions: **unitary**, **bytesize**
- Supports offline datasets
  - enabled only in the OSM plugin

# Built-in map renderer: items

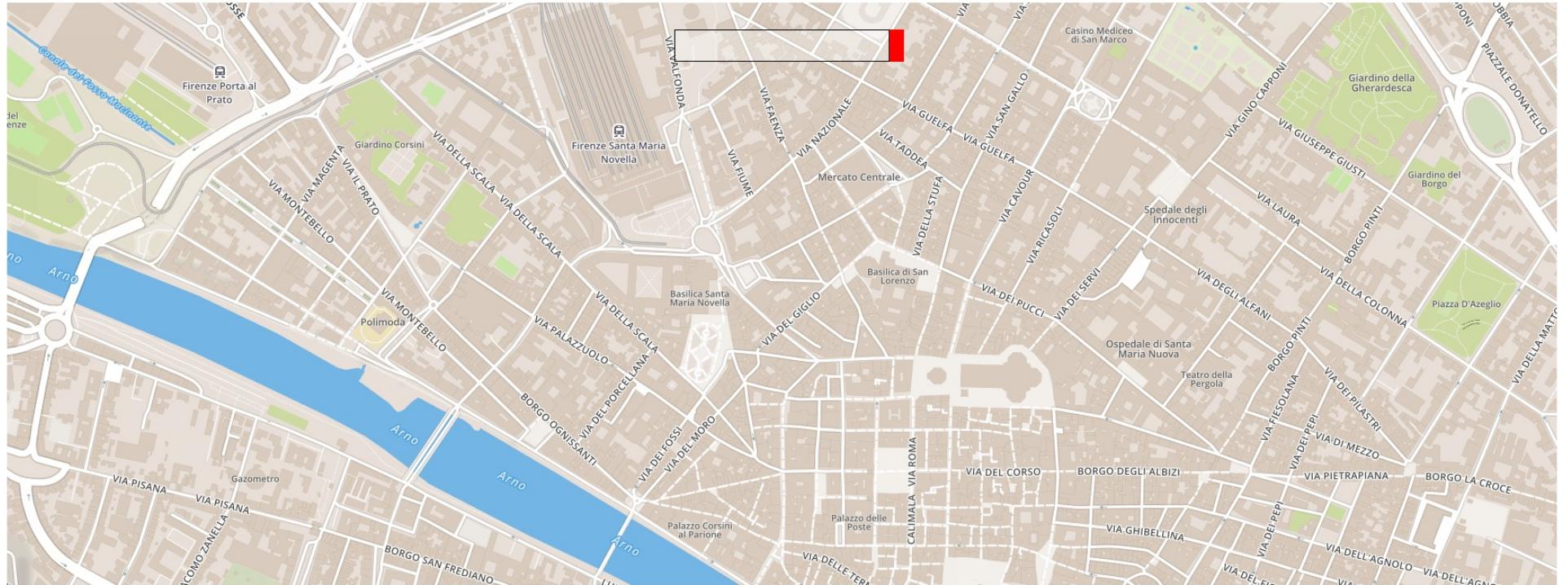
- Geometric and MapQuickItem
- Rotate and tilt with the map
  - drawn on top of the map
- QQuickItems
  - interactive with MouseArea
- Stacked using z property



# Geocoding

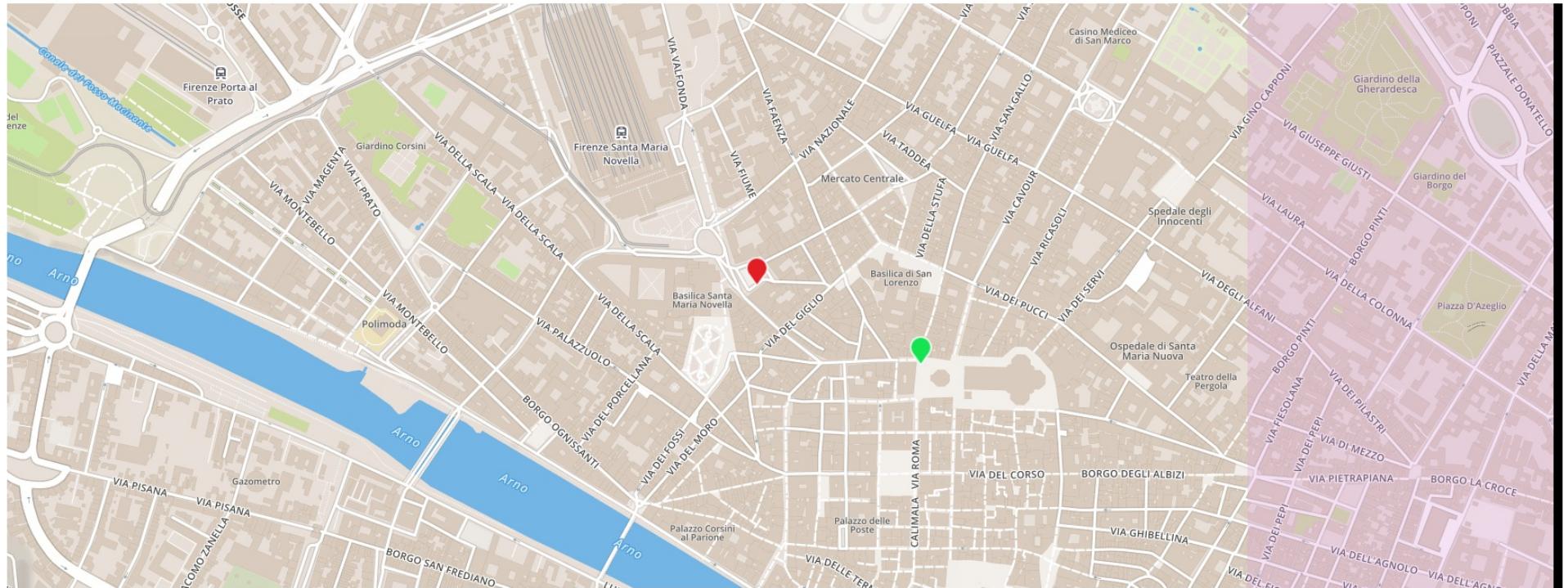
- Forward and reverse geocode

- from coordinate
- from string
- from structured addresses



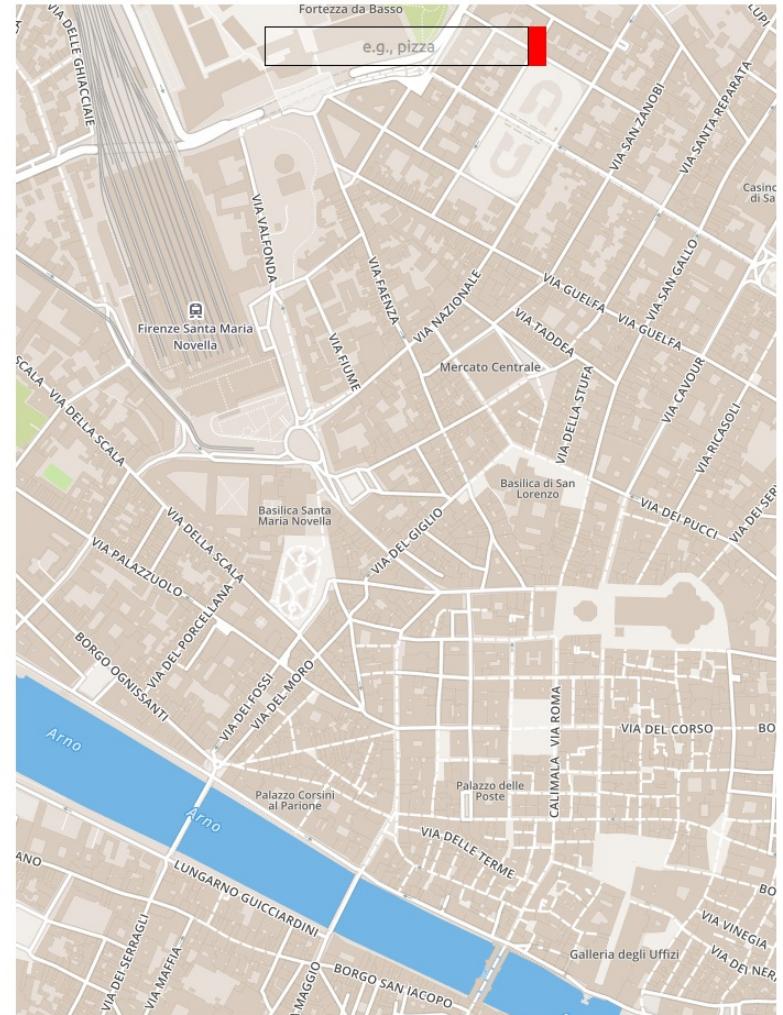
# Routing

- Supports multiple waypoints
- Returns multiple results
  - with directions (Maneuvers)



# Places of interest

- API to search places
  - by free text
  - by category
- and info about them
  - editorials
  - reviews
  - images
- integrated with QtContacts
  - again, some day



# 5.9: infrastructure redesigned

- Finally open to 3rd party mapping engines
  - Everything necessary to return a QGeoMap from a plugin
  - Projection handling now well encapsulated
    - Reusable
    - Extensible (but still private API)
      - Useful only for embedding 3rd party engines
  - QGeoMap can also request to draw map items!
    - Interaction currently still handled by QtLocation
- 3rd party engines: fragmentation risk
  - **MapParameter** to the rescue (**DynamicParameter since 5.11**)
  - Duck-typed QML item (Thanks to the Qt property system)
  - Expose plugin-specific features

## 5.9: Improved layering support

- Map.zoomLevel now normalized
  - for a tile size of 256 pixels
- New plugin: **itemsoverlay**
- New QML type: **MapCopyrightNotice**
  - styleable using CSS
- Programmatically setting zoomLevel also improved
  - when overzoom is enabled, not clamping against min/max

## 5.10: Usability improvements

- Modifiers for scroll wheel
- Map.setBearing with coordinate
- Map.alignCoordinateToPoint
- add/remove MapItemView
- MapType now exposes camera capabilities and metadata
- QGeoPolygon shape

# 5.11: Turn-by-turn Navigation

- New, experimental, Qt.labs.location
  - Navigator
  - MapObjects/MapObjectView
- Improved support for 3rd-party navigation engines
  - potentially using alternative map projections
  - or digital elevation models
  - may drop support to MapItems, offering MapObjects
- Usability improvements, too
  - MapItems can be anti-aliased
  - Waypoint objects for route queries

# 5.12 and beyond

- Backends for Turn-by-turn navigation
  - Mapbox-valhalla
- Map\*Views improvements
  - Allow nesting MapItems inside MapItemViews
  - Allow MapItemView as delegate
  - Support dynamic delegate selection (without Loader)
  - Allow customizing add/remove transitions
- Performance optimizations
  - focus on MapItems and MapObjects
- DEM support
- 3D objects support

# Conclusion

- Complete module for mapping and navigation
- Lots of new features in just 3 releases
- Hopefully opening up new application scenarios
- Just grazing the surface
  - broad module, broader scope, lots of work needed
  - help from the community highly appreciated
    - testing / bug reports
    - suggestions / feature requests
    - code contributions

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