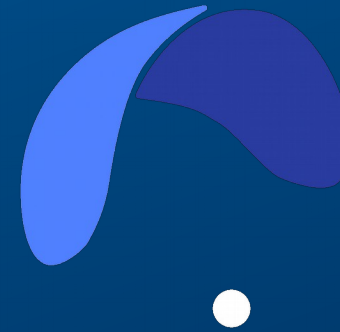Application Development for Mobile and Ubiquitous Computing

GliderMate
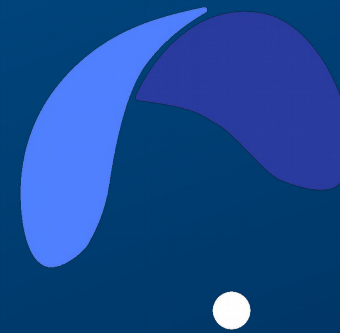# A paragliding tracking app

Group 14: Jonathan Seitz

Application scenario
Use cases

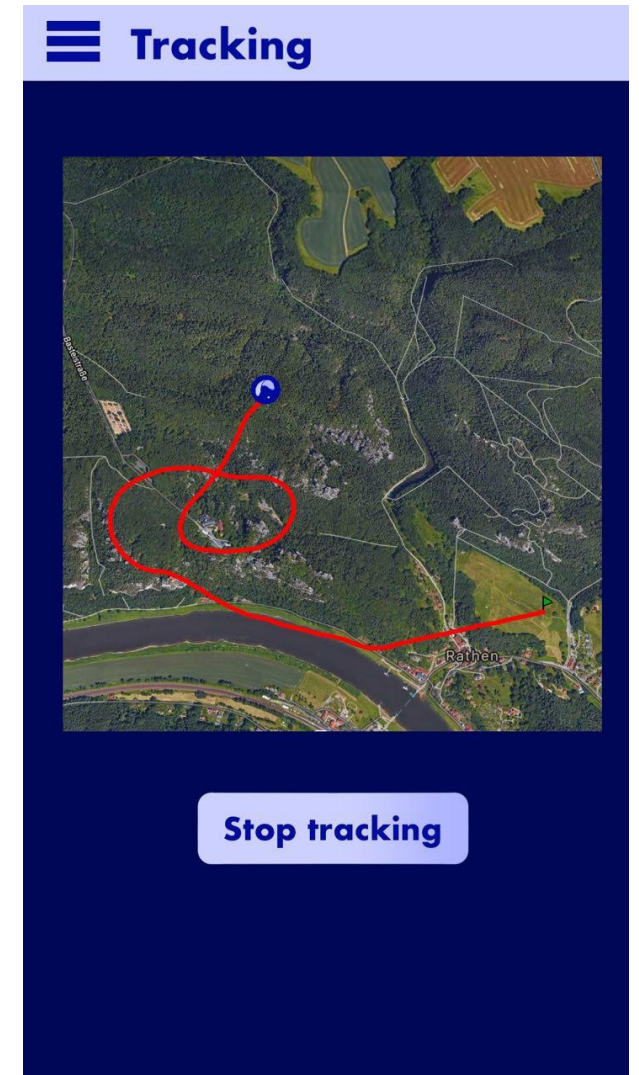GlideMate – Second presentation
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Slide 2

Application scenario

A native Android-Application to support paraglide pilots during and after their flights.

Core features:

- During the flight:
    - Map view with current position marked
    - Compass
    - Track and store flights
    - Show current flight information (speed, distance, ...)

- After the flight:
    - Show flight route
    - Display flight summary (average speed, time, ...)

- Settings:
    - Allow customization (speed unit, map zoom, ...)

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Slide 3

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Application scenario
User story

A paraglide pilot wants to know during a flight:

- Location
    The higher the pilot is over ground, the harder he can estimate his location. (There are no references in the sky)

- Speed, Time, Distance
    Additional flight information can support the pilot to make better decisions during the flight (estimate remaining time/distance, find good landing spots).
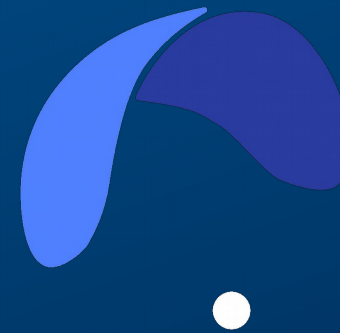
→ With this App the pilot can fly longer and safer.

After the flight:

- Flight route
    The pilot can analyse the flight, compare it with other flights, and learn or improve his flight skills.

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Slide 4

Context & Adaption

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Slide 5

During the flight

Context:

The pilot is in the sky and flying.
→ good GPS-Signal (usual flight conditions: daylight, no clouds, clear air, no rain, no objects between the phone and satellites)
→ maybe poor or no internet connection
→ no possibility to charge (except via power bank)
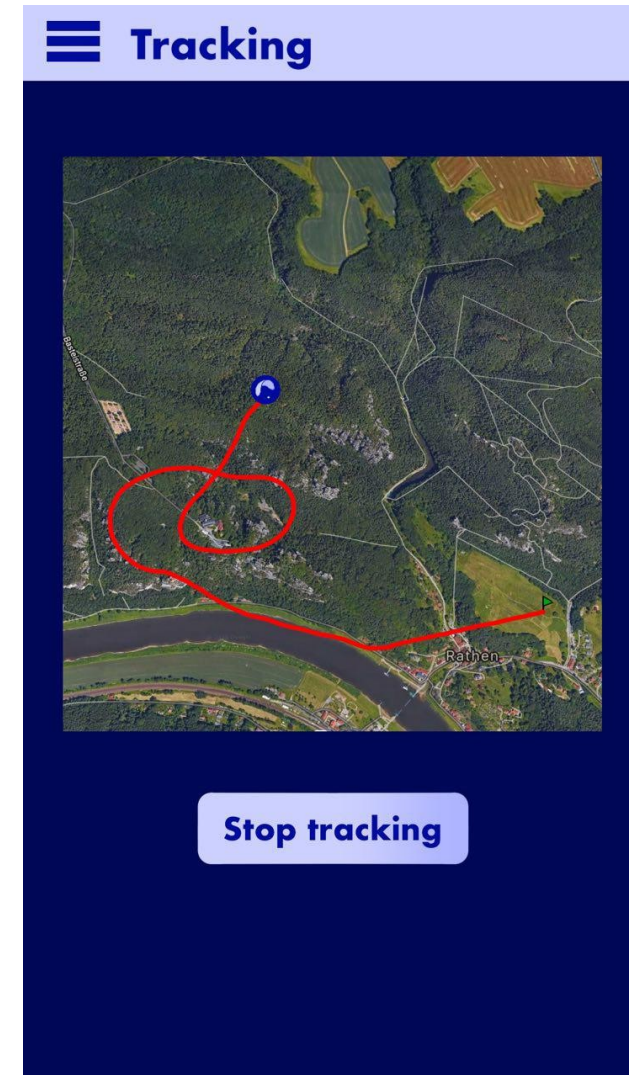→ pilots attention is focused on flying
(App as assistant, not as distration)

Refers to:
- Tracking view

Challenges:
- Energy challenge (limited battery capatcy vs power-intensive GPS)
- Usability challenge (present information clean and simple)

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Slide 6

Adaption – Energy challenge

Monitor:
Battery percentage during flight tracking

Analyse:
Estimate for how long the device power will last

Plan:
Adjust gps sampling rate (sensing) according to power status
(the higher the device power, the more accurate tracking data
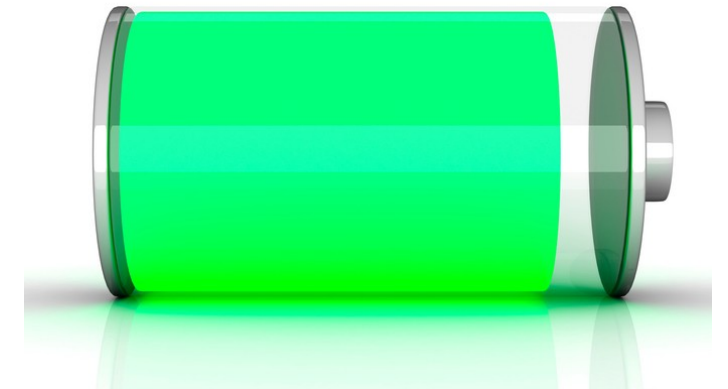should be)

Execution:
Change the request interval
(the higher the battery status, the higher is the gps sampling rate)

Knowledge:
The amount of power (in percentage) that was used in the last 15 minutes of tracking

→ Self-adaption

https://ville.montreal.qc.ca/idmtl/en/battery-icon/

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Slide 7

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Before/ After the flight

Context:
- User wants all information about the flight
- The user adds metadata like images or descriptions to the flight
- Internet connection is better (maybe wifi)
- The user wants to change the settings for the next flight

Refers to:
- Flight list view, Flight details view, Settings view

Challenges:
- Usability challenge (present information clean and simple)
- Usability challenge (allow the user to change units, map settings, ...)

Flight List

Titel

Startzeitpunkt
Landungszeitpunkt
Flugzeit
Streckenlänge

Schnupperfliegen

10:15
15:37
5 h 22 min
1300 m

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Adaption – Usability challenge

Monitor:

Measurement units, map style, map zoom,...

Analyse:

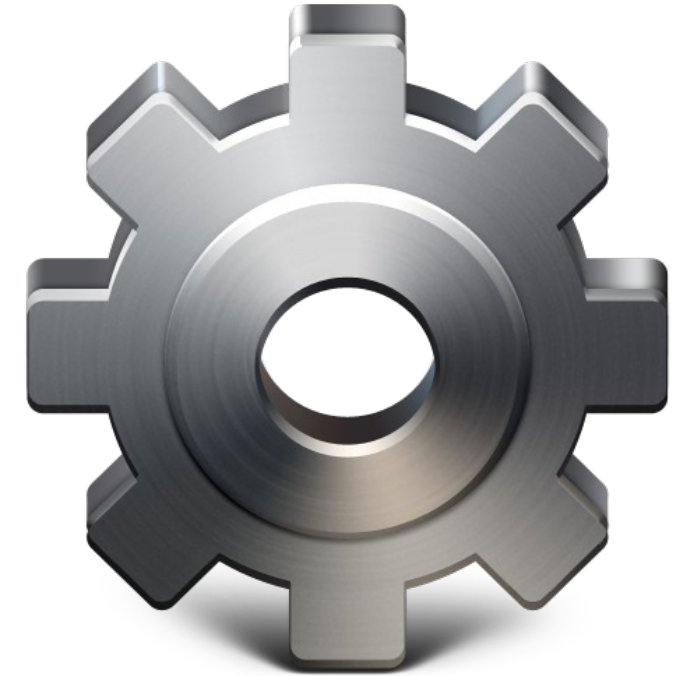Let the user decide and customize in which type information is displayed

Plan:

Add settings where the user can set and change its prefered display configurations.

Execution:

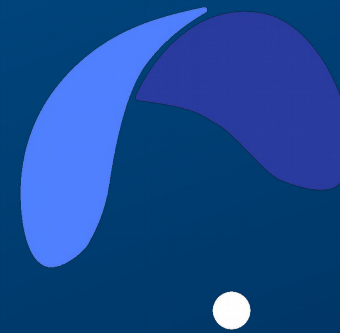Calculate the values and change the view (e.g. speed unit) according to the user wishes

Knowledge:

Which settings, parameters users like to change or edit

https://www.iconfinder.com/icons/1120623/cogs_gear_set_setting_wheel_icon_icon

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Slide 9

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Architecture

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Architecture

MVVM-Pattern (special form of MVC)

Model: represents the data (Flight, GPS-Point, …)

View: Cares about the UI and user interaction
   (basically the front-end, see mockups)

ViewModel: The buisness logic and binder between
   data (Model) and View

Room Database: Persistence of the model data.

SharedPrefeneces: Setting that the user can configure.

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