MSc Theses Proposals by Paulo Ferreira

- Professor at UiO – office in room 10460
  - https://www.mn.uio.no/ifi/english/people/aca/paulofe/index.html

- MSc theses will be done at UiO / PT (10th floor)

- Do you have your own suggestions? Let´s talk !

Learn by doing !

- More information:
  - come to room 10460 and we have a chat
  - send me an email: paulofe@ifi.uio.no
  - Zoom link: https://uio.zoom.us/j/8253296061
  - contact me via Skype, Viber, WhatsApp, etc…

- MSc themes:
  - Java Virtual Machine/Android
  - Ubiquitous/Mobile Systems
  - Distributed Systems

- Requirements:
  - good tracking record (grades, courses), enthusiasm, and commitment.

biklioML – detect bicycle usage on the edge with ML

- **Background:**
 - Biklio (https://www.biklio.com/) is a smartphone app (Android and iOS)
    that promotes cycling (https://www.youtube.com/results?search_query=biklio)
  - It transparently monitors your transport modality
  - When Biklio is confident you've been cycling, you are eligible for a shop benefit
  - Then, you just go to a shop, show Biklio display and you'll get a benefit
  - **One difficulty** lies with the correct detection of the transport mode
    (i.e., that you effectively cycling)

- **Goal:**
  - Develop and tune a ML solution based on:
    - 1) the most recent Activity Recognition API provided by Google,
      https://developers.google.com/location-context/activity-recognition/ (by sampling periodically and
      getting results of the most probable activities at a given time), and
    - 2) a recent ML classifier (developed in a previous MSc based on Woorti - https://www.woorti.com/))
  - Design, implement (in Android), and evaluate both approaches

- **Requirements:** Enjoy and have adequate skills to deal with Java, Android, and mobile system issues
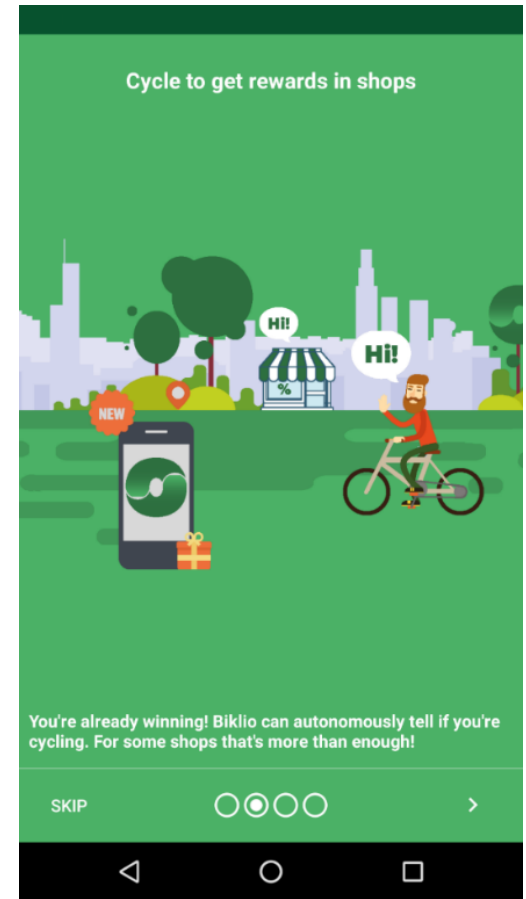
startTRIPstop – automatic detection of a trip start and finish

- **Background:**
  - Automatic detection of when a trip starts is not obvious
  - The same can be said regarding when a trip finishes
  - The sensors in a smartphone can help but it is far from obvious
  - E.g., use the accelerometer to start the GPS
  - The reason being the requirements we want to meet, particularly, accuracy, real-time, and battery usage

- **Goal:**
  - Design, develop for Android smartphones, and evaluate a solution
  - Using the smartphone sensors to detect the start and stop of a trip adapted to the transport mode that will be used

- **Requirements:** Enjoy and have adequate skills to deal with Java, Android, and mobile system issues

mapDetect – using a map for automatic detection the transport mode

- **Background:**
  - Automatic detection of a transport mode is usually done with a ML algorithm
  - The Woorti (https://www.woorti.com/) is a local transport mode detector, i.e. it runs only on the smartphone not requiring network connection, and uses a classifier based on the Random-Forest (https://www.youtube.com/watch?v=o2E1md1t69U&ab_channel=TheMoTiVProject)
  - However, sometimes Woorti is not capable of making a correct detection of the transport mode

- **Goal:**
  - Improve the current Woorti solution, with a map
  - E.g., based on the lines used by public transports, better identify the transport mode being used
  - The information must be minimized so that the any smartphone can use it and it does not occupy much memory

- **Requirements:**
  - Enjoy and have adequate skills to deal with Java, Android, and mobile system issues.

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- Questions?
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web page (these slides): https://www.mn.uio.no/ifi/english/people/aca/paulofe/index.html

course at UiO (IN5600): https://www.uio.no/studier/emner/matnat/ifi/IN5600/index-eng.html