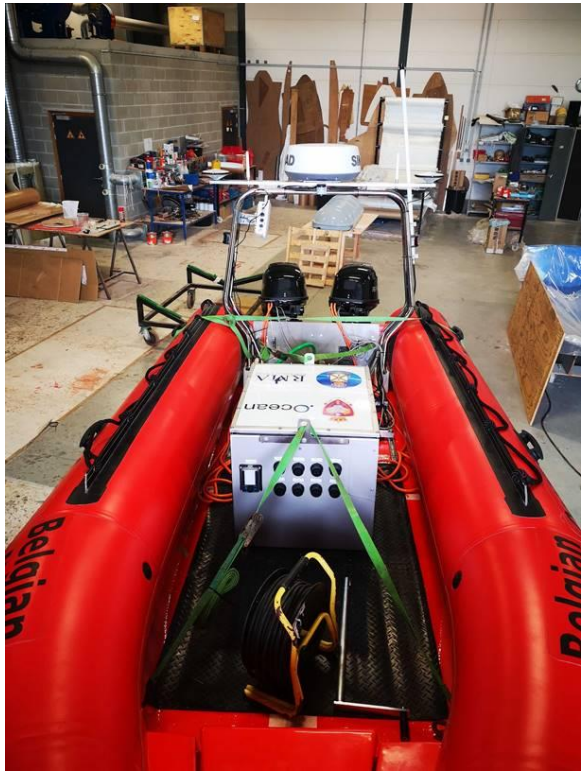
People

- UGent
  - Student: Lance De Waele : lancedewaele@icloud.com
  - Professor: Hiep Luong hiep.luong@ugent.be and Jan Aelterman Jan.Aelterman@ugent.be
- RMA
  - MarLand: Tien-Thanh Nguyen tien.thanh@eu4m.eu
  - MarSur: Benoit Pairet Benoit.Pairet@mil.be
  - VR – SLAM: Charles Hamesse Charles.Hamesse@mil.be

Timeline

- Master thesis:
  - Oct 2021 – end of May 2022
  - Midterm presentation in November – January (!?)
    - 22nd Oct: work plan
    - 9th June: submit thesis
    - 29 June or 1st July: thesis defense
  - December – January: exam time
- Project
  - Data acquisition: planned for October (TBC)
    - ZED Mini: IMU, Stereo cameras
    - Data acquisition hardware: mid October (integrate with MarSur USV ?)
  - Problem formulation, workplan, [literature study]: 22nd October
  - Required skills (Python, Pytorch, RNN, time-series analysis …): January
  - Work on problem: March
  - Writing thesis: May



Motivation

- Estimate and predict the ship motion from IMU – and stereo vision
  - MarLand:
    - Define the optimum moment for the drones to land on the ship
      - Less impact on the drone
  - MarSur (!?):
    - Stabilize the sensor inputs
      - Filter out the ship movement
    - Horizon detection, could be used for control USV
- State prediction problem
  - Given current states (and states in the past): IMU data
  - Given latent space (images) of future action/input: images of incoming waves
  - Predict the states in future
  - Stock market example

Problem

- Inputs:
  - Sequence of IMU data + stereo images in the timeframe (t-Δt_1,t)
    - Other sensor maybe used – wind sensor, thrust of the USV
- Output
  - Ship motion: altitude (z), roll, pitch, yaw (angles and angular velocities) in the time (t, t+Δt_2)
- Challenges:
  - Estimation + prediction for time series sequences (visual features: water/waves)
  - Define Δt_1 and Δt_2
  - Realtime

Way of Working

- Bi-weekly meeting with small presentation
  - Status/Result of given tasks (from previous meeting)
  - Issues
  - Plan for next 2 weeks
- 2 tasks will be given after each meeting
- Use Slack as communication channel
  - New ideas
  - Issues
  - Q&A