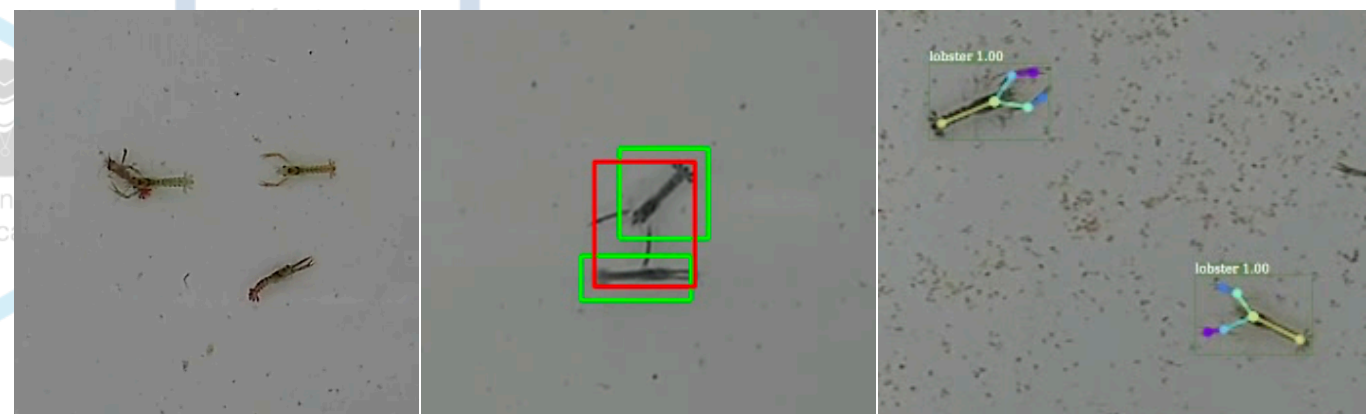**The caretaker**

AI, AI, AI, WHAT A GENTLE LOBSTER!

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lab-affiliated events

lab-scale experiments

access to real-world problems and datasets

cloud-scale experiments

state-of-the-art

doctoral and masters' education

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Problem Description

- The market demand for European lobster is huge (4-20 billion NOK/year)

- Existing production technology is based on keeping lobsters separated in individual compartments due to their aggressive and cannibalistic behavior, which makes this solution too costly to allow industrial expansion.

- Preliminary studies conducted by us over recent years does show variation in aggressive behavior in cohorts of 30-40 individuals. This implies that one might be able to select less aggressive/docile individuals by using behavioral phenotyping based on advanced computer vision, machine learning and robotic technology.

- The successful selection of less aggressive lobsters will lay the foundation for the establishment of a new export industry in Norway.

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Data

- Hundreds of hours of video of small lobsters in various compartment are available.

- From these, a substantial amount of labeled frames are available:

  - Bounding boxes for detection of both individual lobsters as well as interaction between lobsters.

  - Key-points of lobsters joints.
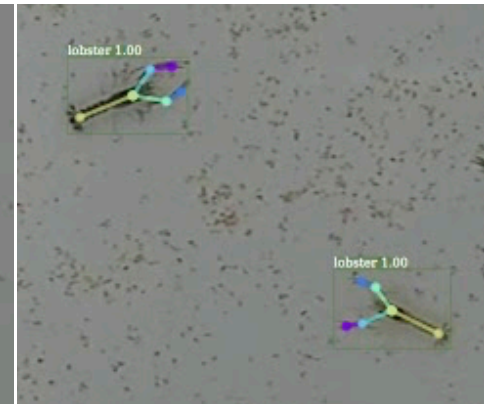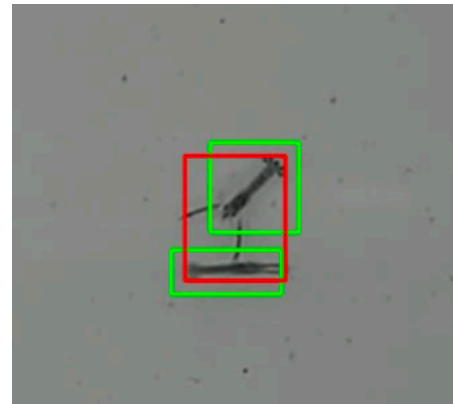
Tasks / Challenges

- Detect all individual lobsters as well as interactions (aggressive behavior) between lobsters in long video sequences of the compartments.

- Detect key-points of individual lobsters before, during and after all the interactions.

- Track both lobsters and their corresponding key-points over longer periods (a given lobster must have the same ID before and after an interaction)

- Use the extracts information above to classify each individual lobster into gentle, aggressive or neutral/not decided.

- Provide the necessary information (e.g. coordinate) to the robot in order to move either the gentle (positiv selection, preferably) or the aggressive lobsters into another compartment.

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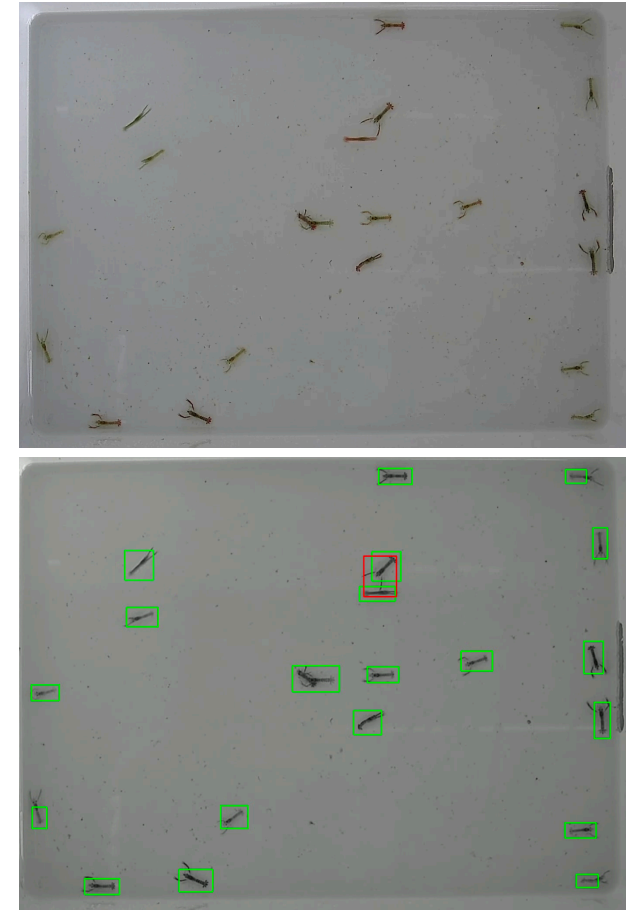
Tasks / Challenges (2)

- The project is available for one or two students.
- Some architectures that can be investigated as a start:
  - YOLOv3, Faster R-CNN++
  - Mask R-CNN, Detectron2
- A number of extension can be looked into.