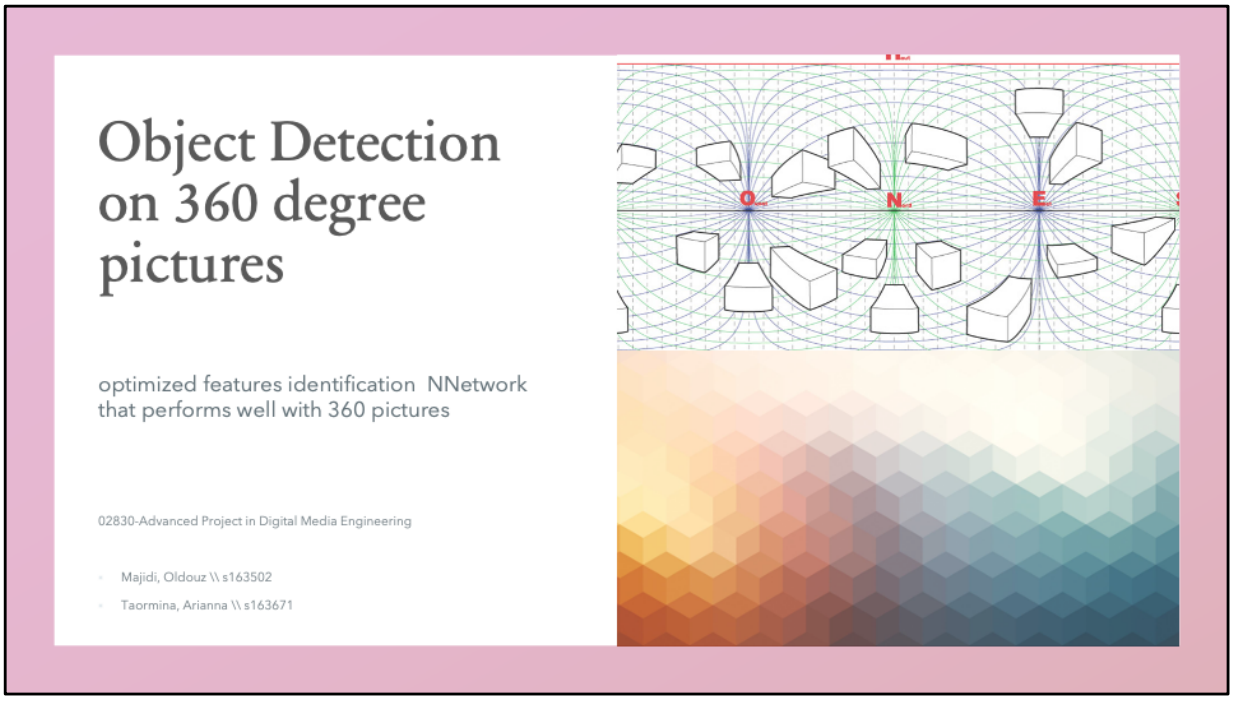


CONTEXT

We want to get an optimized features identification Network that works well with 360 pictures
We are applying transfer learning with pretrained model (yolov3)

We have 4 different sources of data:

- Our own 360 degrees pictures > (250 in total) 20 with fire extinguishers
- Data swiped from internet with google API (normal pictures of fire extinguishers) > 500
- Google 360 degree pictures > (3333 in total) 100
- Data augmented with preprocessing > 517 with fire extinguishers

Preliminary Tests Results –Test1

- **SCOPE**: verify model is training and learns
- **CHALLENGES:** updating package to latest tf and keras, complete a successfull job with hpc nodes
- **INPUT**: 500 images and 500 labels, standard*
- **OUTPUT**: trained model over 200 epochs
- **RESULT**: completed, successfully

* Hololens database

Preliminary Tests Results –Test2

- **SCOPE**: verify model is training and learns with our own data
- **CHALLENGES:** minor not conceptual error can at any point jeopardize a full training, memory issues
- **INPUT**: >50(0) images and >50(0) labels, only augumented images
- **OUTPUT**: trained model over 10 and 200 epochs
- **RESULT**: completed, but..

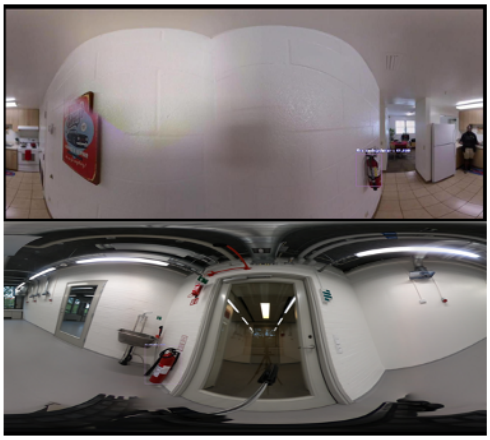
Trained both with 50 and 500 images
Trained both with 10 and 200 epochs

Full run of the training and evaluation, but detection didn't work.

Here we used only images deformed, so it is kind of expected.

Preliminary Tests Results –Test3

- **SCOPE**: verify model is training and learns with our own full data
- **CHALLENGES:** minor not conceptual error can at any point jeopardize a full training, memory issues
- **INPUT**: >1000 images and >1000 labels, mixedimages
- **OUTPUT**: trained model over 200 epochs-> fail, stuck after 12 cause of memory issues
- **RESULT**: completed



Dataset was a mix:
All the sources that we had.

Sampled 70% for train and remaing for testing.
Gave 1023 pictures and labels.

This run on 200 epochs, but got interrupted after 12 epochs.
The model after 11 epochs was ok and gave a result in the detection task.

Assessment of results

- ACHIEVED GOALS:
  - BUILD GOOD DATASET: so that the model learns. Done (test3)
  - TRAIN A MODEL OVER A NEW CATEGORY: transfer learning from pretrained YOLO.v3, with new feature “fire extinguisher”. Done (test2, test3)
  - OBJECT DETECTION with new model over 360 degree picture. Started, objects detected. Done (test3)

Next steps

- **IMPROVE OBJECT DETECTION** with the new model over 360 degree picture. Evaluate over pictures with different degrees of deformation. Improve detection(see pic)
- **MORE DATA**: get to > 500 non deformed labelled pictures
- **COMPARISON** between models: with different batch sizes
- **COMPARISON** between models, test on 360 degree:
  - - model trained with only non deformed images,
  - - model trained with only deformed images
  - - mix model trained with both deformed and non deformed images (current)

NEXT GOALS:

- OBJECT DETECTION with new model over 360 degree picture. Evaluate over pictures with different degrees of deformation.
- MORE DATA: get to > 500 non deformed labelled pictures
- COMPARISON between models: with different batch sizes
- COMPARISON between models:
  - - model trained with only non deformed images, test on 360 degree
  - - model trained with only deformed images, test on 360 degree
  - - mix model trained with