Master's Thesis Engineering Technology

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Applying machine learning algorithms on multi-sensor applications

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Situation

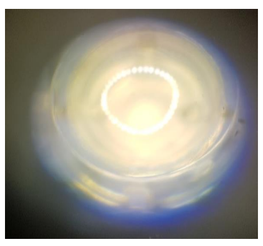
Patients who lay on a bed for an extended duration, will obtain bedsores. These sores have to be logged manually by a doctor. The end goal of this IMO-project, is to create an automated system to log the recovery of the wound and to detect any abnormal symptoms.

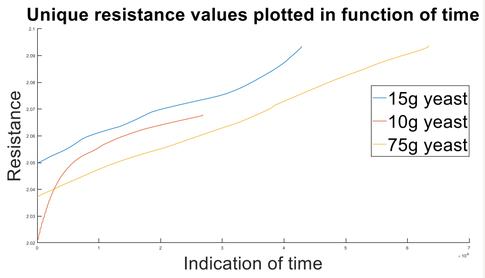
Objective

Doing a feasibility study on machine learning on medical applications by implementing algorithms on multi-sensor applications that are related to healthcare situations.

Predictive machine learning

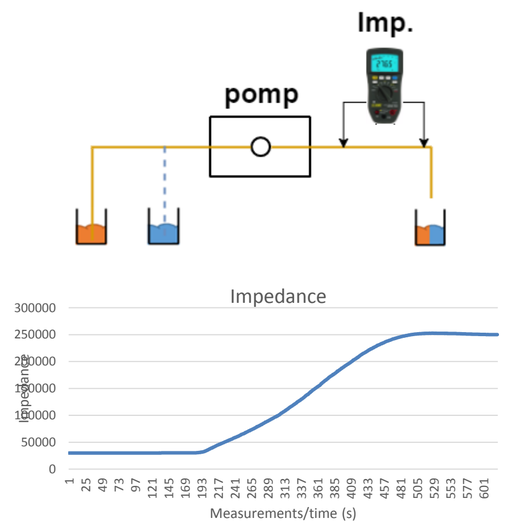
Applying regression on the growth of yeast cells in a controlled atmosphere to determine the most optimal environment.





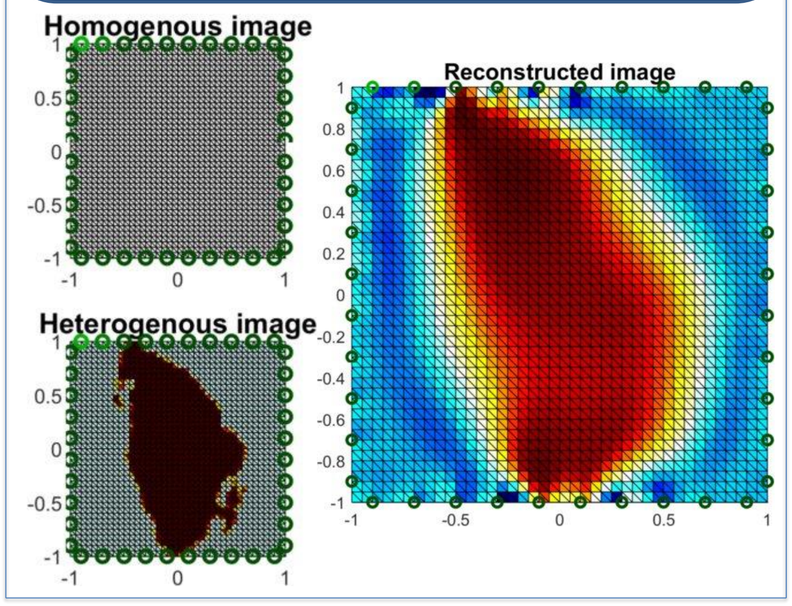
Predictive machine learning

Using regression to determine the liquid that is present in a tube. It will determine the concentration of juice in a watery substance.



Classification machine learning

Implementing a neural network with TensorFlow on tomography data of wounds, to detect, identify and follow the healing process.



Conclusion

the main objective was to do a feasibility study on implementing machine learning algorithms on medical applications, which succeeded. The study on tomography and neural networks seems to be useful in the real-time monitoring of wound recovery. While a similar form of regression on liquids, could be applied to liquids in infusion pumps. Finally, we have the regression on yeast cells which could be useful for many health-related applications.

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