

A Machine Learning Algorithm to Determine Concentration of Ethanol in Fluids

CHALLENGE

- Detection of very small concentrations of ethanol in fluids
- The algorithm should be robust to the environmental noise
- Outstanding performance is required for practical applications

PARTNER



Dr. Amin Rajabzadeh

This project was led as a research project by Dr. Rajabzadeh. He is specialized in the field of biochemical engineering and has several experiences in leading biotechnology research projects done at McMaster University.

TEAM

Faculty leads:

- Dr. Amin Rajabzadeh
- Dr. Seshasai Srinivasan

Program representative:

- Dr. Robert Fleisig

Students:

- Sanaz Dastjerdi
- Samin Farajollahi

MILESTONES & OUTCOME

- Predicted the concentration of ethanol in the simulated saliva and oral fluids based on the current-voltage signal taken by biosensors.
- Designed a specialized machine learning algorithm that can differentiate between various concentrations.

VALUE

- The proposed machine learning approach can precisely detect the concentration of ethanol in noisy environments
- Efficient and fast enough to be integrable on the current embedded processors

NEXT STEPS

- Using more advanced machine learning approaches such as deep learning by collecting more data
- Designing and fabricating biosensors for practical applications

STUDENT REFLECTION

- How to apply signal processing techniques on bio-signals
- How to use machine learning algorithms to classify bio-signals

