Diploma Thesis

Short Description

Reproduction management is an important aspect driving productivity of dairy farms. Modern dairy farming relies heavily on the use of artificial insemination, therefore precise knowledge of ovulation times of cows is essential. The conventional technique of visually observing cow activity levels throughout the day becomes largely unfeasible as herd sizes increase. Automated monitoring solutions can help reduce the workload for farmers.

In a previous thesis project, acceleration and temperature data from a wireless rumen sensor together with a multivariate deep learning model (Long Short Term Memory) was used to build a proof of concept heat detection system. This covered data preprocessing, generation of label data and a simple deep learning approach. The goal of this thesis will be to build on the previous project, incorporate some of the lessons learned regarding training data and build an improved model.

Your Tasks

- Familiarization with the data and existing codebase
- Literature research regarding multivariate time series classification (as required)
- Improvement of training data
- Expansion/improvement/redesign of the deep learning model

Your profile
- Motivation and interest in the topic
- Background in machine learning/signal processing
- Good python skills
- Previous experience with pytorch (or tensorflow) is a big plus (existing codebase uses pytorch)
- Experience with pandas is also a plus

Additional information
This project is a cooperation with the company smaXtec. smaXtec has developed a dairy cow monitoring solution that helps farmers keep track of their animals health, feeding and reproduction. The results of this thesis will be used to improve the reliability of reproductive monitoring for dairy farmers.