Open Thesis / Project
Generating Synthetic Time-Series Data for Cow Activity Traces

Motivation

Synthetic data allows studying and sharing of potential sensitive data without the risk of a privacy breach or leak. Synthetic data is generated by a model, which was trained on real data and learns its statistical properties. Thus, generating synthetic data can also be adapted and used for the prediction of missing values or the detection of outliers. Training of such a model is usually done by using a Generative Adversarial Network (GAN) or a Variational Autoencoder (VAE).

Time-series data is a series of data points (*e.g.*, temperature measures, sensor readings or stock prices) in time order. Such a sequence can be studied to gather insights about the process yielding it, for extracting statistics or used to predict future values.

Goal of this thesis is to develop machine learning models for generating synthetic time-series sensor data for cow activity traces. Dairy cows are nowadays equipped with different sensors monitoring temperature, activity and other health related metrics. This data can be used to train a GAN or a VAE for generating similar sensor data.

Interested? Please contact us for more details!

Target Group

Students in ICE and Computer Science.

Thesis Type

Master Thesis (Duration: 6 months).

Goals and Tasks

- Thorough literature research on the topic.
- Implement a generative machine learning model
- Evaluate the results of this generative model
- Summarize the results in a written report, present and demonstrate the prototype.

Requirements:

- Creativity, interest in state-of-the-art machine learning methods
- Programming skills in Python.
- Knowledge of in deep learning frameworks (TensorFlow/Keras or PyTorch) is recommended, but not mandatory.

Used Tools & Equipment

- A laptop
- Your skills

Contact Persons

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