Sveriges lantbruksuniversitet
Swedish University of Agricultural Sciences

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Evaluating locally measured weather and weathers services

The purpose of the project is to compare predicted, reported and measured weather data from the Swedish Meterological and Hydrological Institute (SMHI) with data collected from weather stations within SLU Lantmet. This project is the first step towards enabling researchers to integrate farm-level data from herd management systems and genome analysis collected by SLU Gigacow with weather data to conduct long term studies on how weather conditions affect animal health and milk production.

Objectives for the project are to:

- Conduct a literature study on currently available methods to study animal-environment effects caused by weather.
- Compare data collected from weather stations with measurements and interpolations provided by SMHI.
- Provide summary statistics of available data and the distribution of measurement errors for different parameters caused by using interpolated values from a weather service versus installing weather stations at each farm or pasture.

The expected outcome of the project is that animal scientists will be provided with scripts and knowledge to better interpret and handle meteorological data for research purposes. Depending on the outcome of the project the SLU Gigacow infrastructure will collect and store data from SMHI and/or weather stations installed on the 17 farms participating in the research network to support animal-environment research in dairy farms.

All scripts and visualizations produced in the project will be published as open source code via a Github repository. The aim is also to produce one scientific article on the topic describing the process and the measurement errors estimated by the project. We encourage the student to participate in this writing either as the main (first) author with support from the main supervisor.

Requirements: Python is the preferred programming language and to complete the project you must be comfortable working with API:s such as the ones provided by SMIH (http://opendata.smhi.se/apidocs/) and SLU Lantmet (clickable link). An interest in in meteorological data and animal science is beneficial but not required.

During the project you will be working as a part of the SLU Gigacow team working at the Department of Animal Breeding and Genetics at SLU campus Ultuna (see https://www.slu.se/gigacow for more information) with Dr Tomas Klingström (tomas.klingstrom@slu.se, https://www.slu.se/cv/tomas-klingstrom/) as your main supervisor. Most work can be conducted remotely but a working space will also be provided as necessary.

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