

Master Thesis

Data processing methods for in-ovo egg sexing in the hatchery

The project in brief

7 billion male chicks are culled every year in the world since they do not lay eggs and their meat is too lean for the food market. The eggshell is transparent for gas molecules and eggs emit gas slightly different if the hatched chicken will become male or female. A method to classify eggs at day 0 from laying would save the male chicks from culling, the eggs will instead contribute to food production. The SiC-FET sensor detects the emitted gases from eggs. Pattern recognition methods on the sensor signal is used for in-ovo sexing. Results from egg-testing in the laboratory show that > 90% classification seems possible to reach. The sensor signal from chemical sensors experiences some drift due to the chemical reactions that take place on the sensor surface. For the same reason, the sensor temperature is of crucial importance. The goal is robust algorithms that functions with egg handling robots in the hatchery.

Main activities

The sensor is a gas sensitive transistor. It is operated at different temperatures from 250 to 450°C in repeated cycles of about 1-2 minutes. The different hydrocarbons emitted from the egg has an optimum sensitivity at different temperature. Data processing using different features from the temperature cycle is the strategy to find the pattern that reveals the sex of the becoming embryo. The master thesis work will be to test different data processing strategies and apply this on data where different temperature cycles have been used.

Requirements

This thesis work is suitable for a student with background from the Department of Computer and Information Science with focus on Data Processing. Knowledge about sensor systems is an advantage but not a requirement.

Time and place

This thesis work is planned to take place **VT22**. The work will be carried out at Linköping University at The Division of Statistics and Machine Learning and The Division Sensor and Actuator Systems.

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