



## IMAGE PROCESSING FOR EARLY DETECTION OF LIVESTOCK DISEASES

### INTRODUCTION

African swine fever (ASF) is a highly contagious viral disease that affects wild and domestic swine. Due to the severe sanitary and economic consequences that this disease causes in the swine industry worldwide, the European regulations require strict control measures for its eradication. Among them, we find animal sacrifices, movement restrictions, farm disinfection and quarantine or 2-level zoning around infected farms.

The use of biosensors to monitor animals remotely in real time may provide an alternative to sentinel sampling and nowadays is a priority area of research. These systems measure behavioural changes to assess animal well-being and health to maximize productivity, but the same sort of measurements may also be useful for infection surveillance.

The RAPIDIA-FIELD project (Rapid Field Diagnostics and Screening in Veterinary Medicine, [www.rapidia.eu](http://www.rapidia.eu)) is a 3 years European project that aims to develop new strategies and resources for early detecting of livestock diseases under the collaboration of several private companies and recognized institutions in the veterinary medicine field.

### PROBLEM DESCRIPTION

Ten healthy pigs were continuously monitored with a video surveillance system in a closed pen. Their activity was recorded 24 h per day using IP cameras connected to a control centre. Changes in the animal behaviour after an ASF infection has been proven. Specifically, a decrease in motion.



This work aim to process video images in order to

1. detect animal contours,
2. quantify animal motion (collectively and individually),
3. classify animal status as 'sleeping', 'feeding', 'walking' or 'playing' through motion quantification,
4. estimate a threshold in the animal behaviour able to predict or suspect a possible infection.

## SKILLS DEVELOPED

- Notions of image processing. Specially, knowledge in data processing libraries in Python, C++ or Matlab.
- Notions of machine learning and statistical analysis.
- Team work.

## STAGES

1. Presentation.
2. Introduction of the general problem and providing a raw analysis of experimental data.
3. Time-tasks distribution and organization.
4. Study of libraries for data processing on specific programming languages.
5. Develop code for batch motion monitoring in real-time.
6. Statistical and machine learning tools implementation for behaviour classifying.
7. Report.



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