

Porcine Lie Detectors

A framework for automatic quantification of posture state
and transitions in farrowing sows

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Aim and Objectives

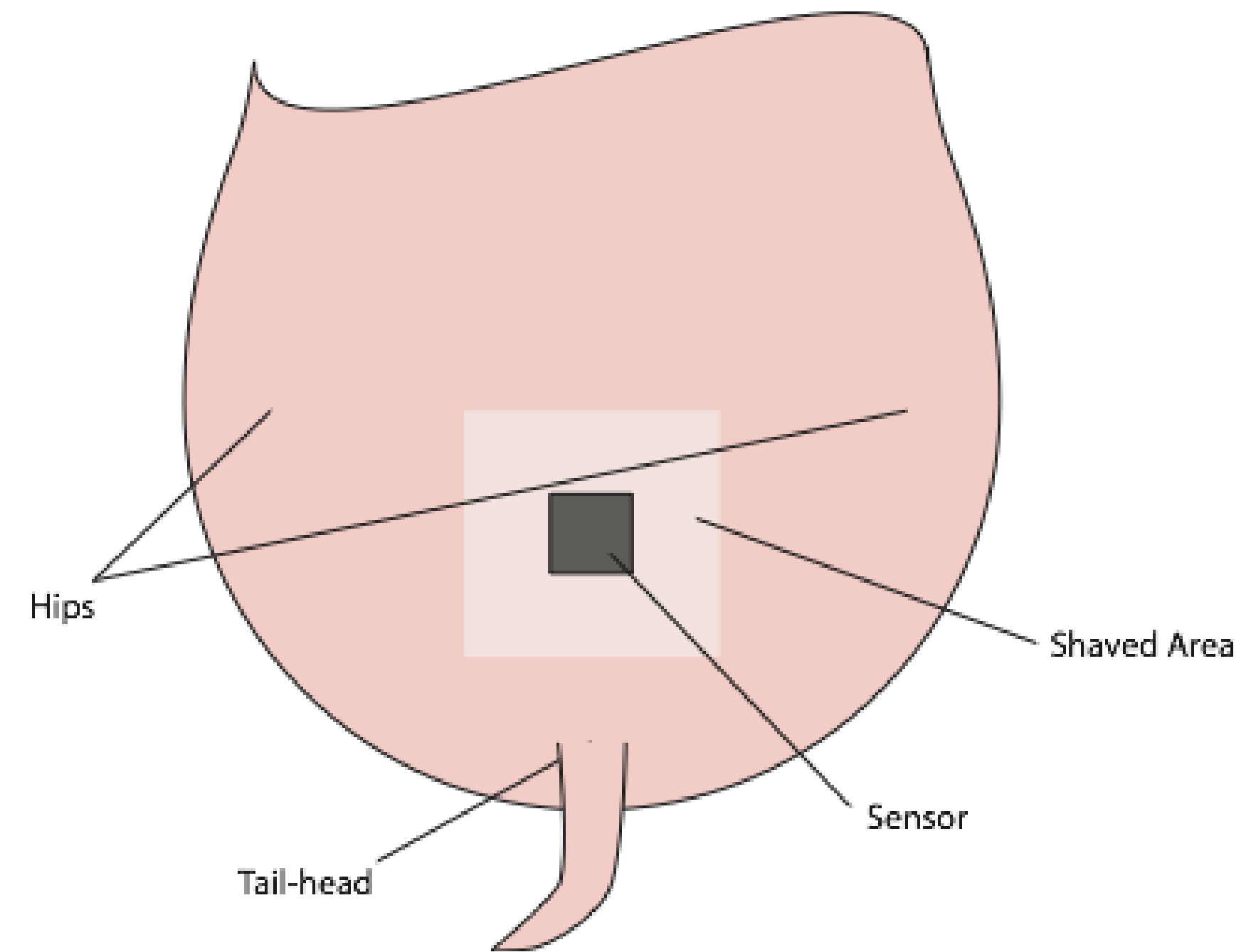
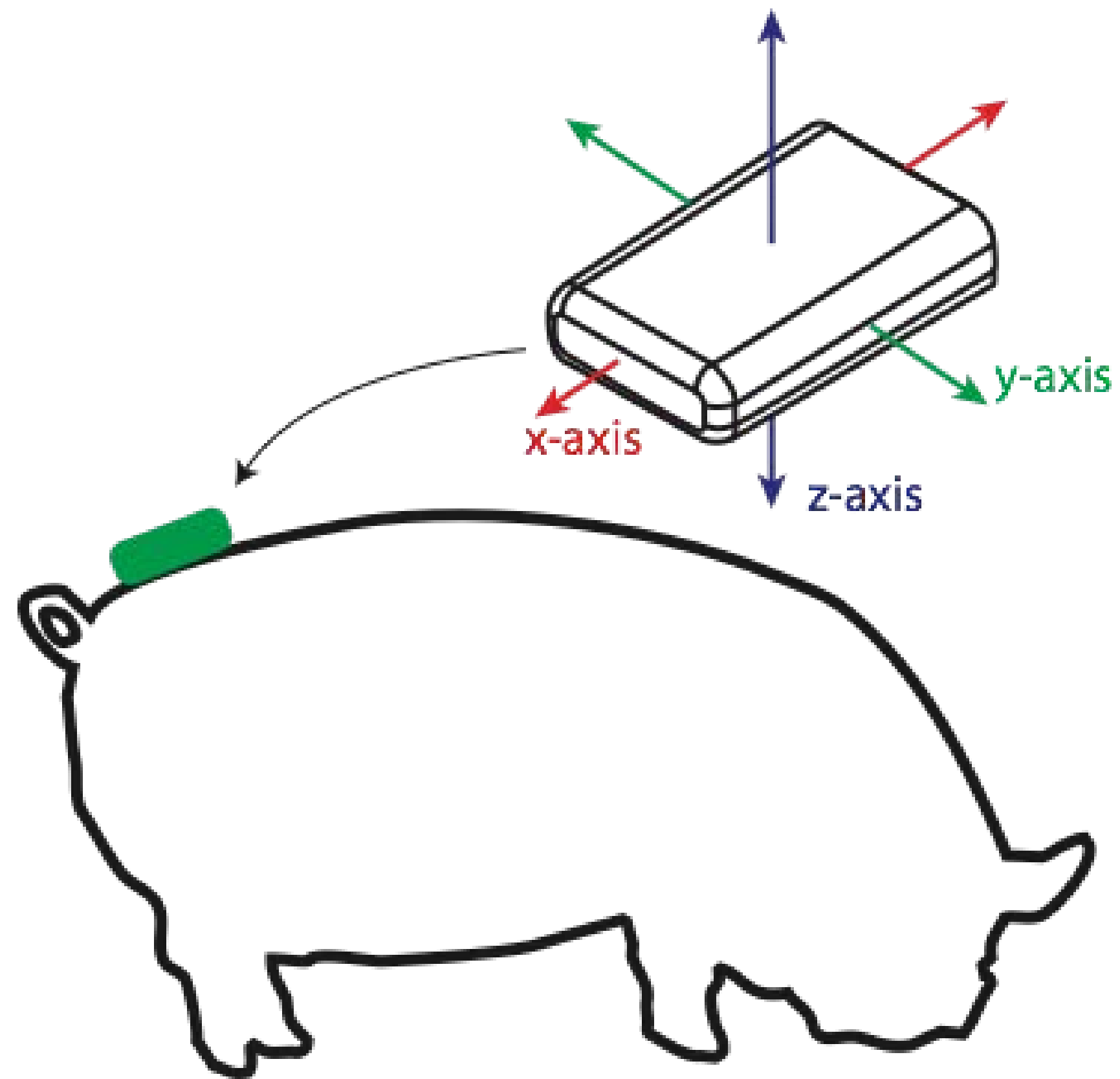


- To develop a methodology for automatic quantification of posture and posture transitions of sows
- Identify characteristics of posture transitions to describe potentially dangerous lying behaviours
- Provide an extensible platform suitable for use in large scale deployments.

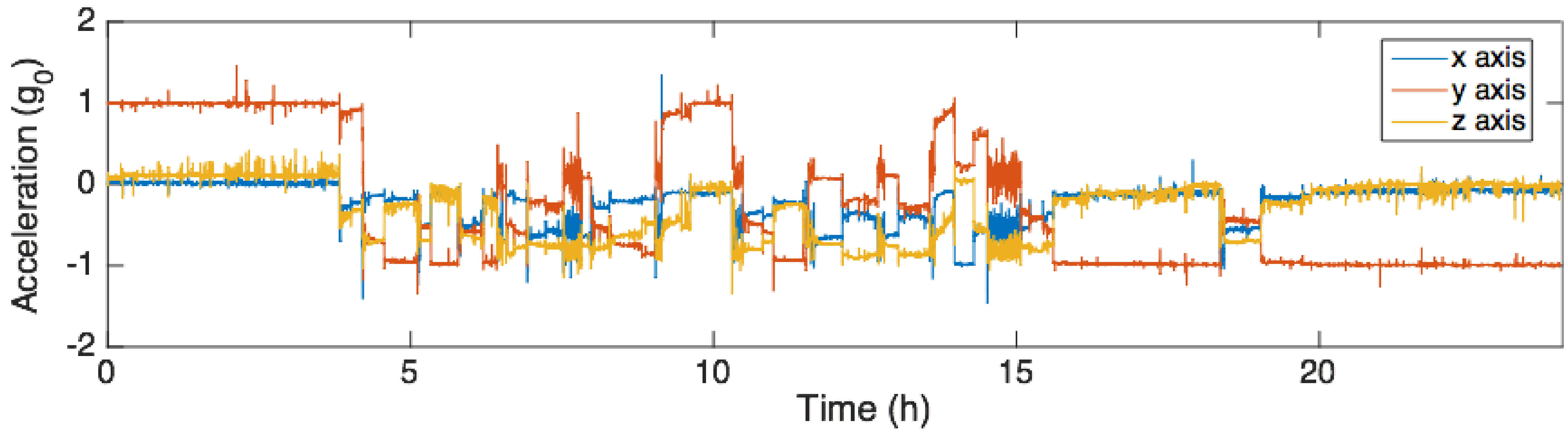
Data Collection



Sensor Placement



Data Processing



Pitch and Roll

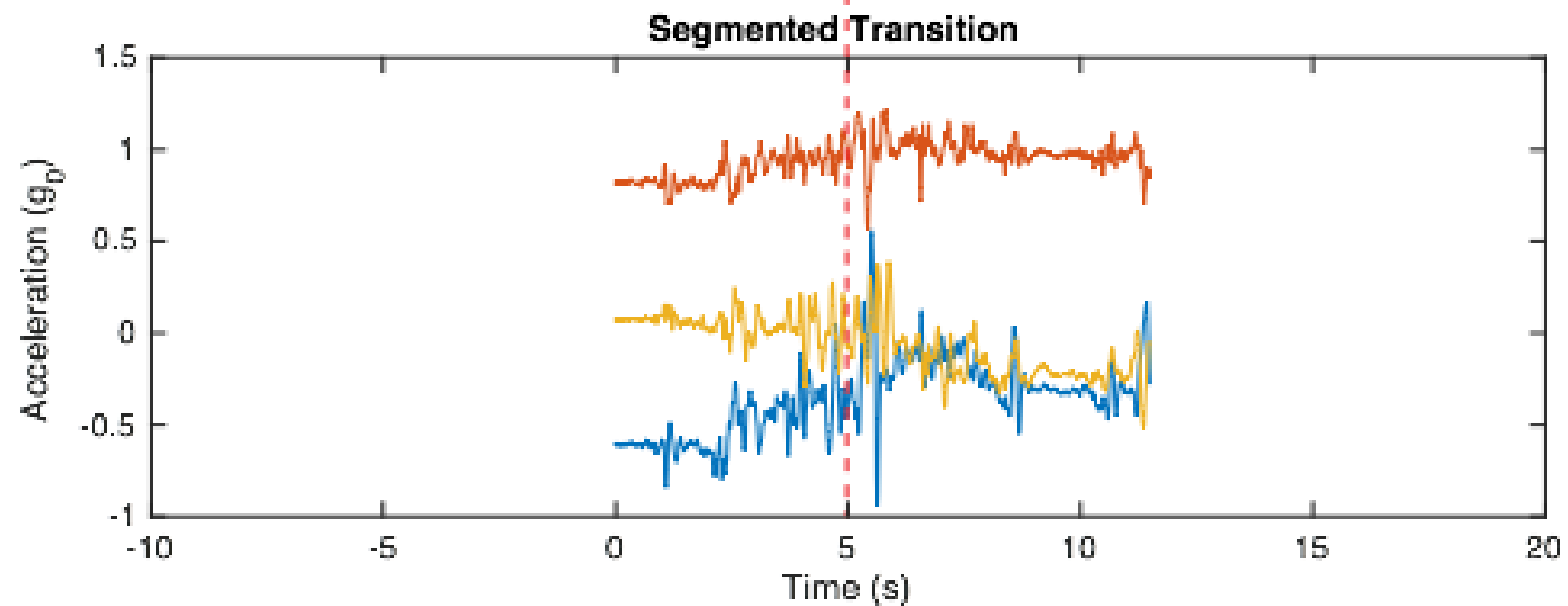
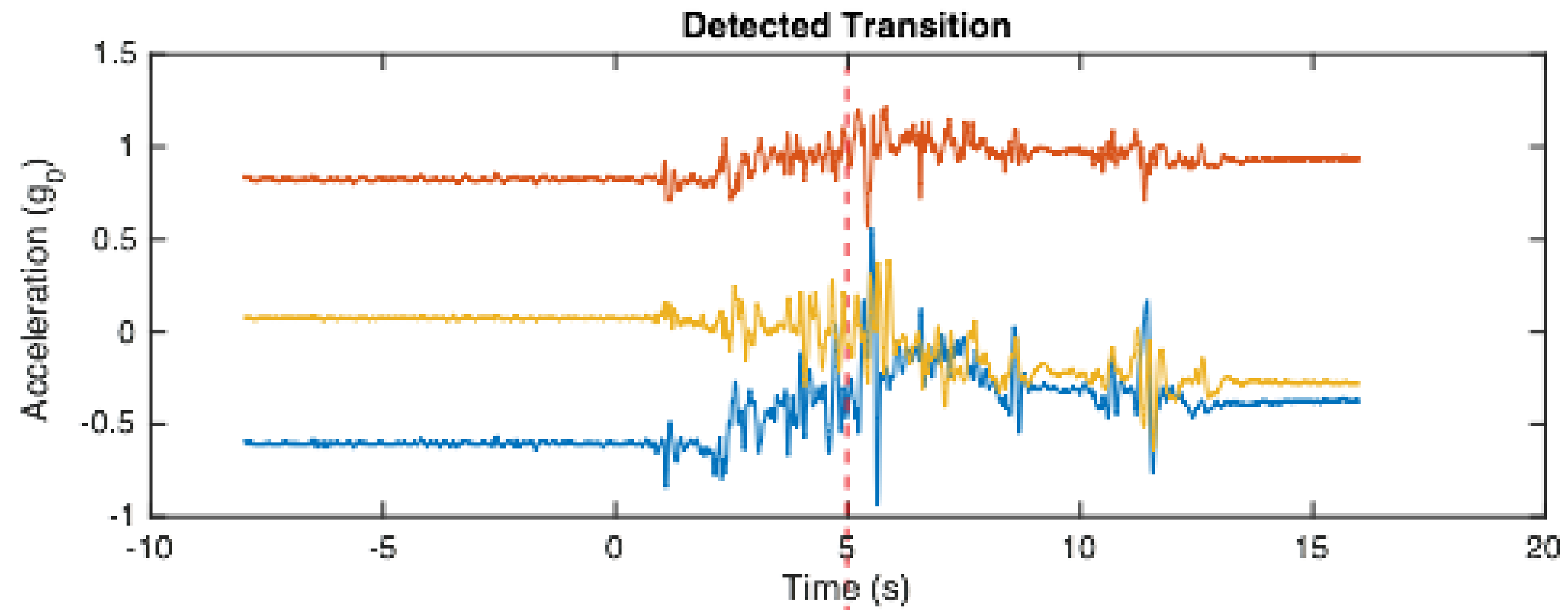
Pitch



Roll



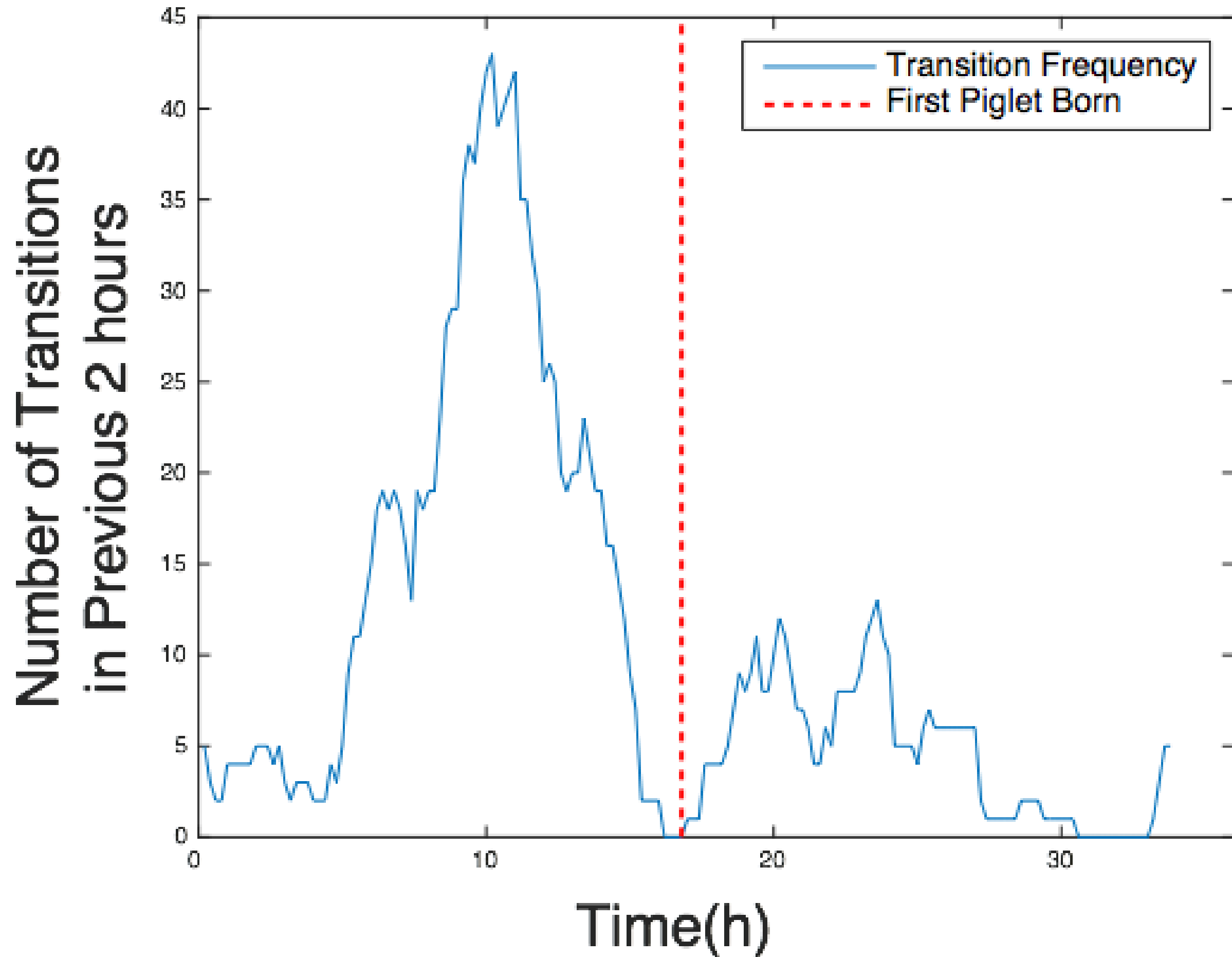
Segmenting Posture Changes



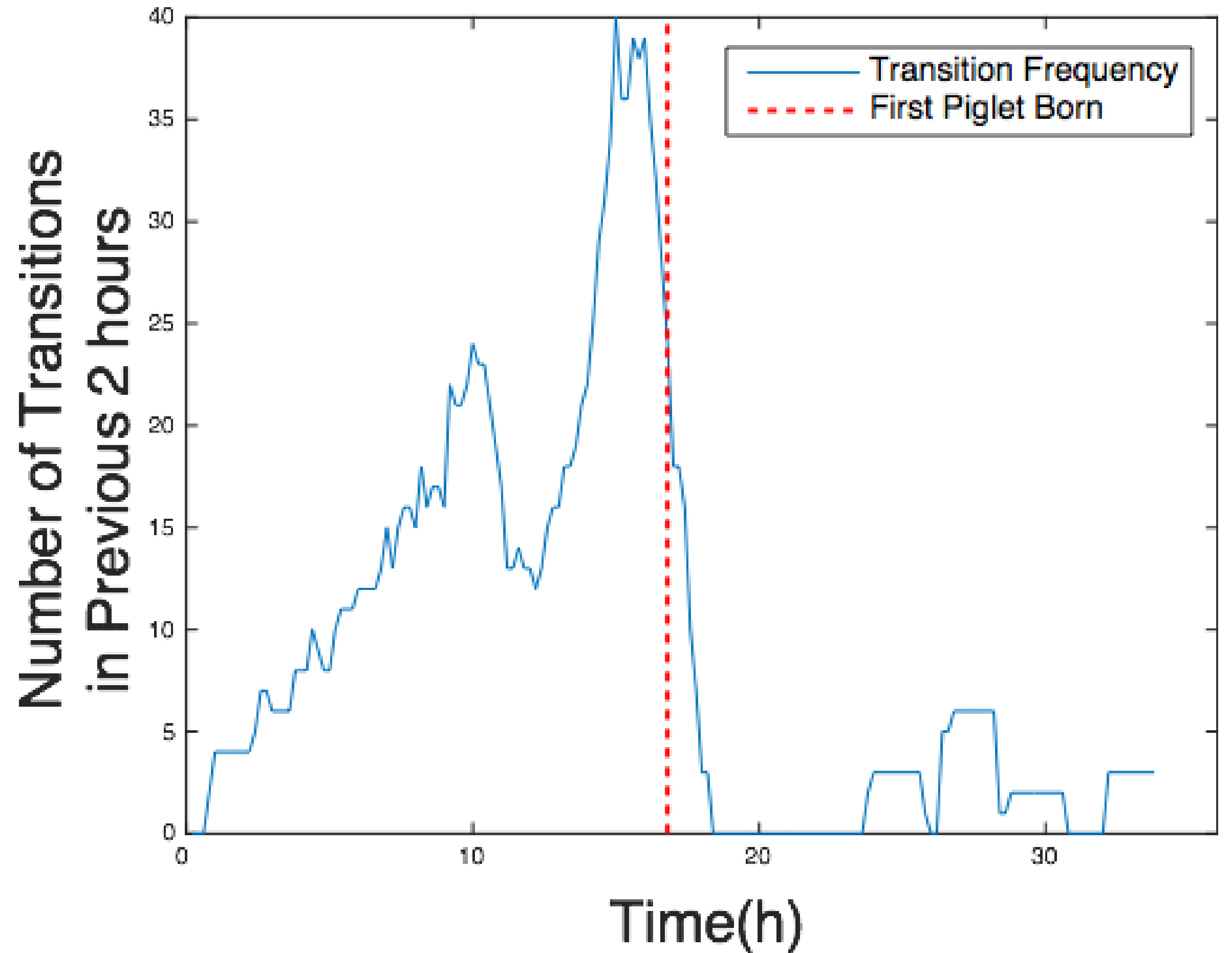
Posture Transition Frequency



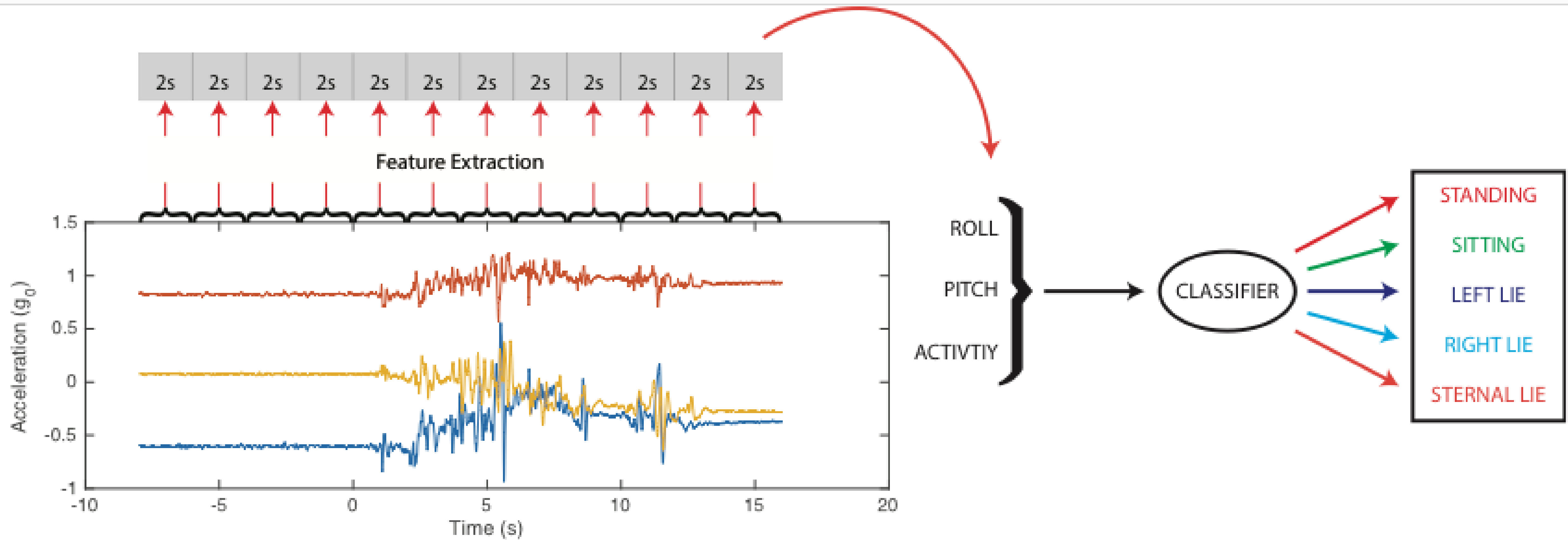
Pig106



Pig107



Posture Classification



Transition Features



Duration

Range of Acceleration

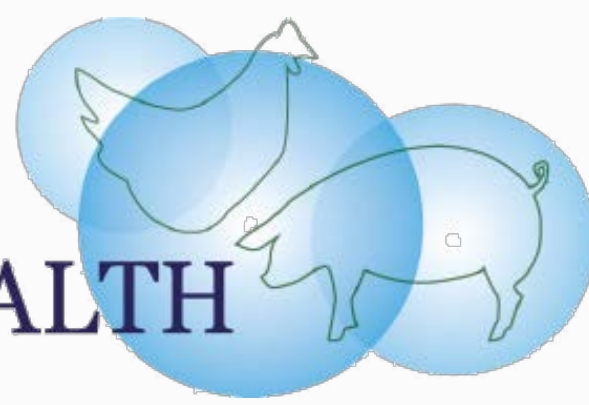
Jerk

Rate of Change of Pitch and Roll

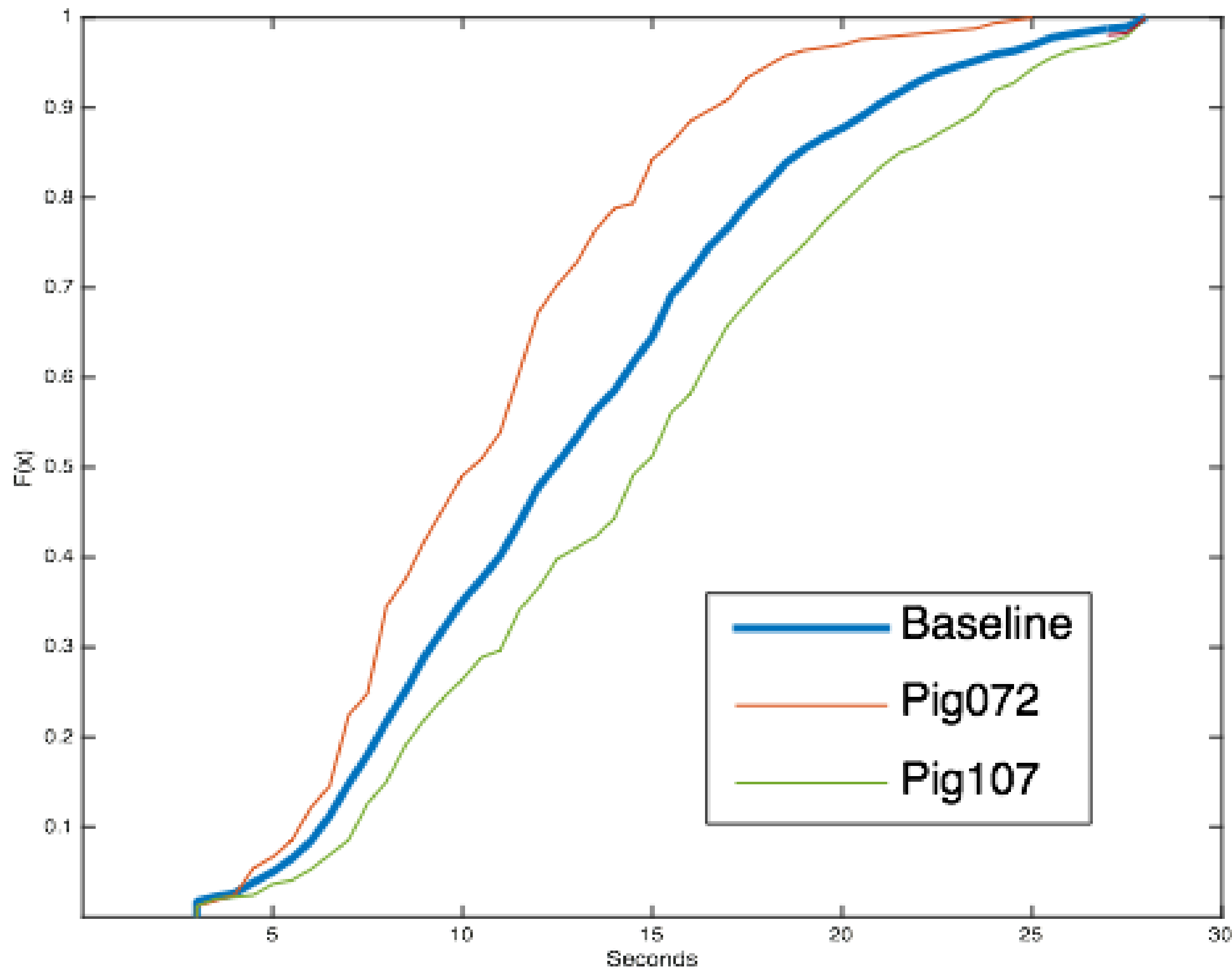
Maximum Acceleration

Evaluating Transitions

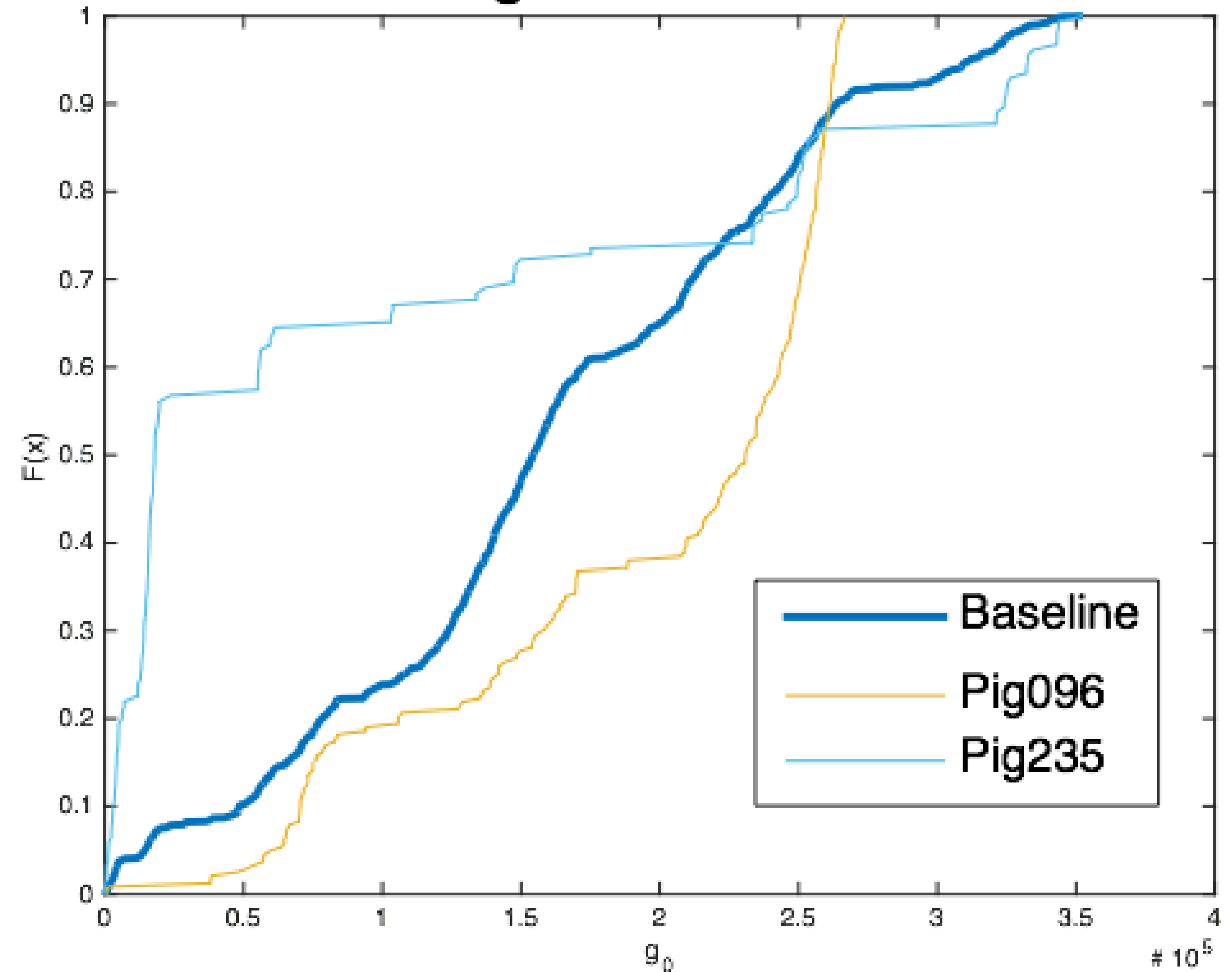
PROHEALTH



Duration



Range of Acceleration



Segmentation Results



Total **1268** transitions

965 correctly identified (True Positive)

204 missed (False Negative)

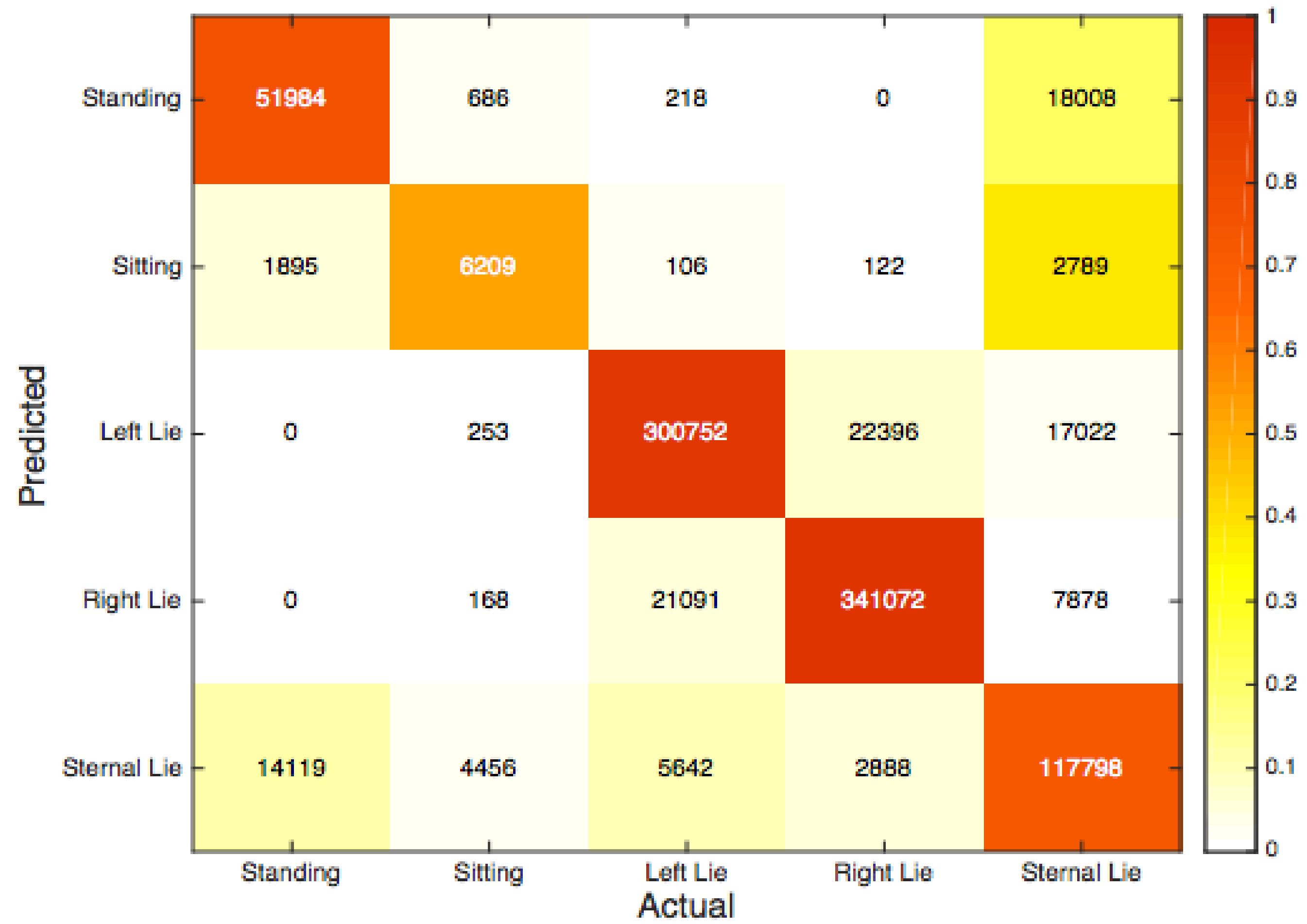
305 incorrectly identified (False Positive)

Precision: **0.83**

Recall: **0.76**

F₁ score: **0.78**

Posture Classification Results



Summary



Inertial Sensors on farrowing sows

Descriptors of lying behaviour

Identify movements patterns potentially dangerous to piglets.

Thank You