Case Studies

Inteligencia Artificial en los Sistemas de Control Autónomo
Máster en Ciencia y Tecnología desde el Espacio

Departamento de Automática

Objectives

1. Apply ML to realistic scenarios

Bibliography

- None

Table of Contents

Case studies

Case study 1: Bank propensity model

Client

- Bank

Business problem

- Identify those clients prone to buy a service

Data

- Available on several databases
- Historical data on service adquisition available

Propose a solution to:

- Data adquisition
- ML task
- Predictive or explicative model
- Model explotation
- Model maintenance

Case studies

Case study 2: Social media compaign impact

Client

- Car manufacturer

Business problem

- Real-time analysis of a campaign impact in Twitter
- Answer if people have a positive reaction to the campaign

Data

- None

Propose a solution to:

- Data adquisition
- ML task
- Predictive or explicative model
- Model explotation
- Model maintenance

Case studies

Case study 3: Hubble FGS-3 servo failure prediction

Client

- NASA

Business problem

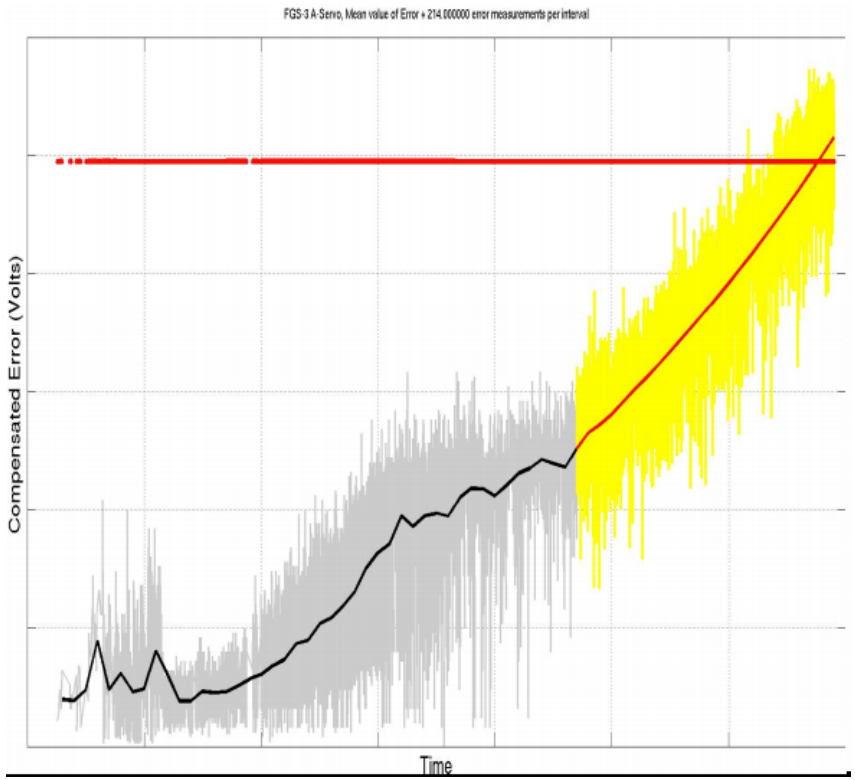
- Predict Hubble FGS-3 servo failure

Data

- Compensated error telemetry
- Servo will fail if compensated error exceeds a threshold

Propose a solution to:

- ML task
- Predictive or explicative model
- Model explotation
- Model maintenance



(Source of this study case)

Case studies

Case study 4: Fall detection with triaxial accelerometer

Client

- Technological start-up

Business problem

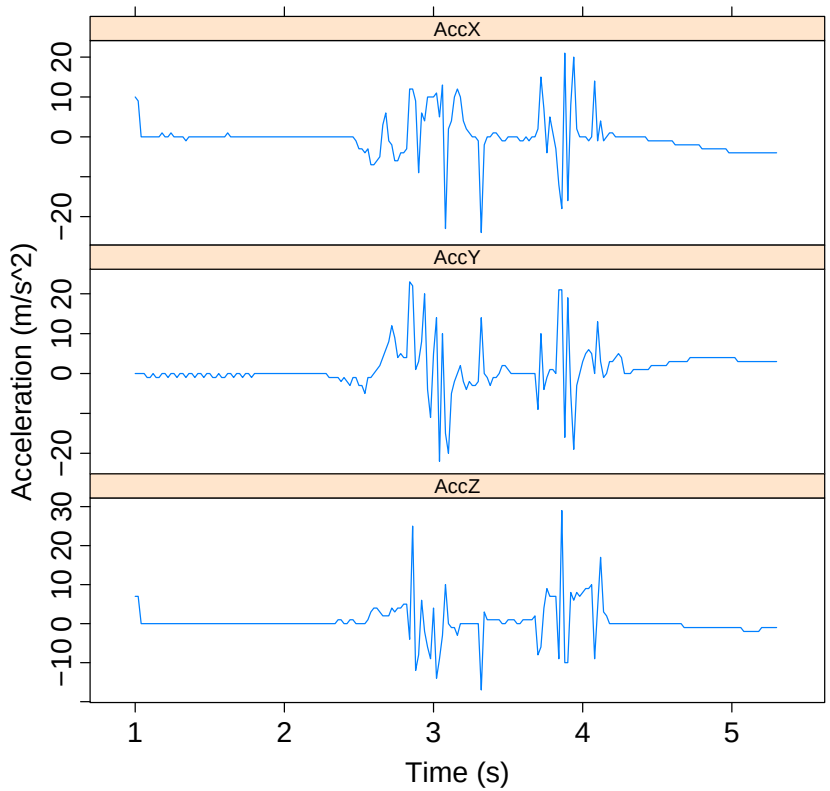
- Detect falls with a smartwatch
- Improve elderly people attention

Data

- None

Propose a solution to:

- Data adquisition
- ML task
- Data preprocessing
- Model explotation
- Model maintenance



(More info)

Case studies

Case study 5: Fall detection with sound

Client

- Technological start-up

Business problem

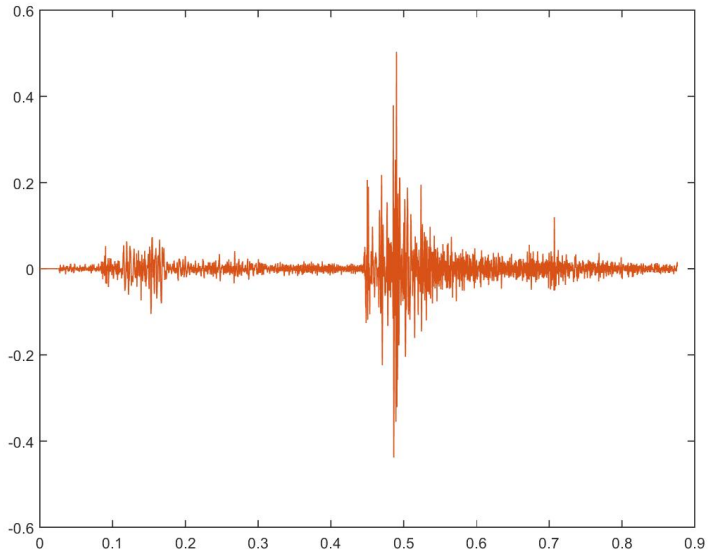
- Detect falls with sound
- Improve elderly people attention

Data

- None

Propose a solution to:

- Data adquisition
- ML task
- Data preprocessing
- Model explotation
- Model maintenance



Energy Mean	Energy Std
Number of Zeros Mean	Number of Zeros Std
Spectral Flux Mean	Spectral Flux Std
Roll off Factor Mean	Roll off Factor Std
Spectral centroid Mean	Spectral Centroid Std

(More info)

Case studies

Case study 6: NASA JPL BioSleeve

Client

- NASA JPL Advanced Robotics Group

Business problem

- Recognize hand gestures (more info)

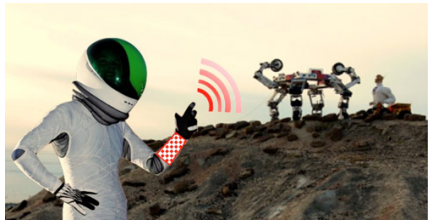
Data

- None

Propose a solution to:

- Data adquisition
- ML task

(Source)



(Source)

Wolf, Michael T., et al. *Decoding static and dynamic arm and hand gestures from the JPL BioSleeve*. IEEE Aerospace Conference. IEEE, 2013.

(Solution) (Results)

Case studies

Case study 7: UAV terrain classification

Client

- NASA JPL Advanced Robotics Group

Business problem

- Recognize terrain type for automatic UAV landing
- (Video)

Data

- UAV down-looking camera
- No dataset available

Propose a solution to:

- Data adquisition
- ML task
- Feature extraction