MAS513-Advanced Robotics project:

# Online health status detection of a motor

PROBLEM: Is it possible to determine the health status of the motor continuously using non-contact sensors and non-destructive testing?

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State of art:

Detection of the health status of the motor using **contact sensor** such as:
- Temperature sensor
- Vibrometer/accelerometer
- Voltmeter and ammeters.

The vibration of the shaft is related to defects of the inner components of the motor, i.e. bearings. Each harmonics is associated to a specific fault.
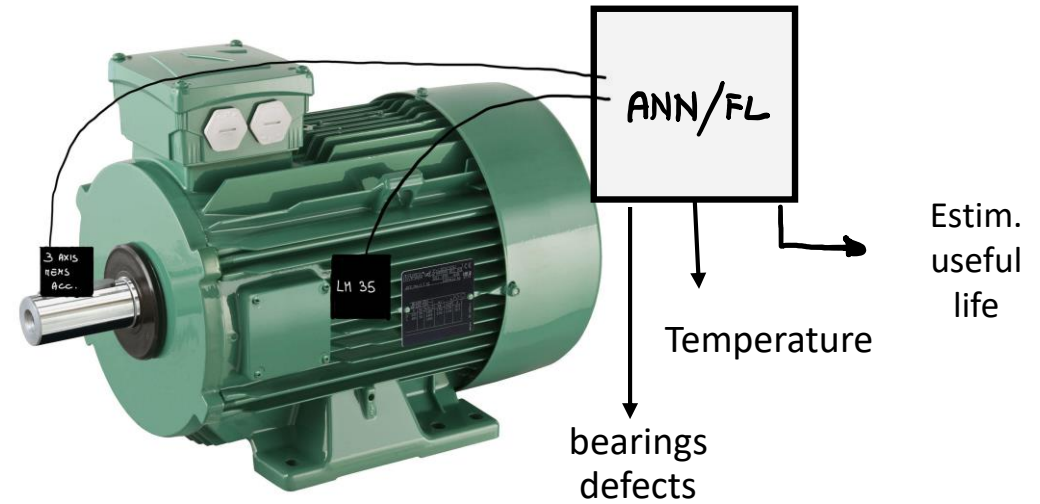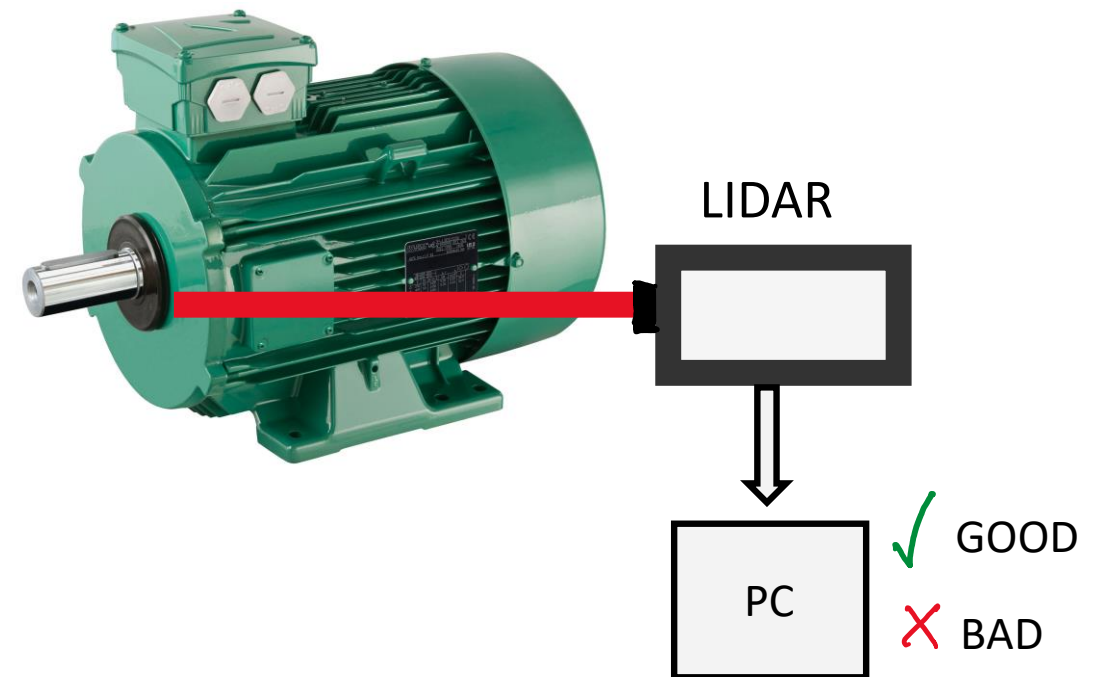
Project's aim

The aim is to determine the continous health status of the motor using a non-contact sensors that measure the vibration of the shaft.
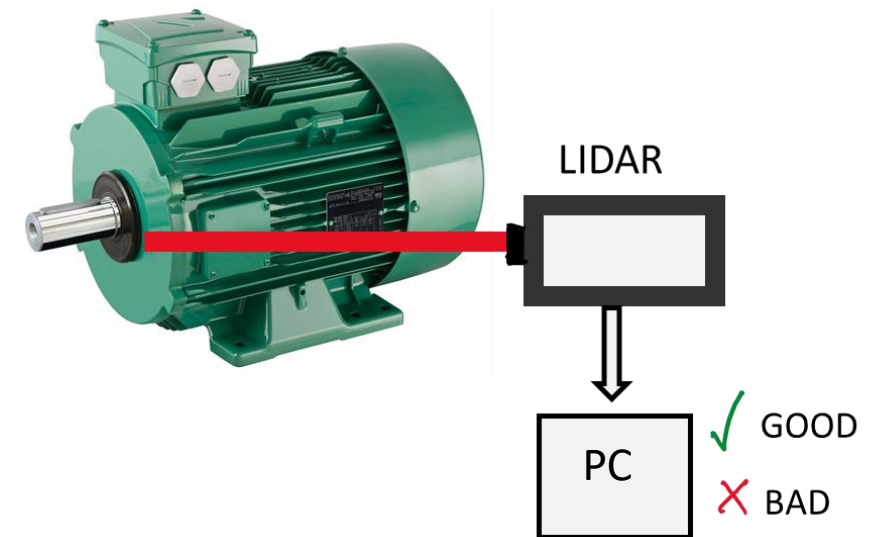
PROS:
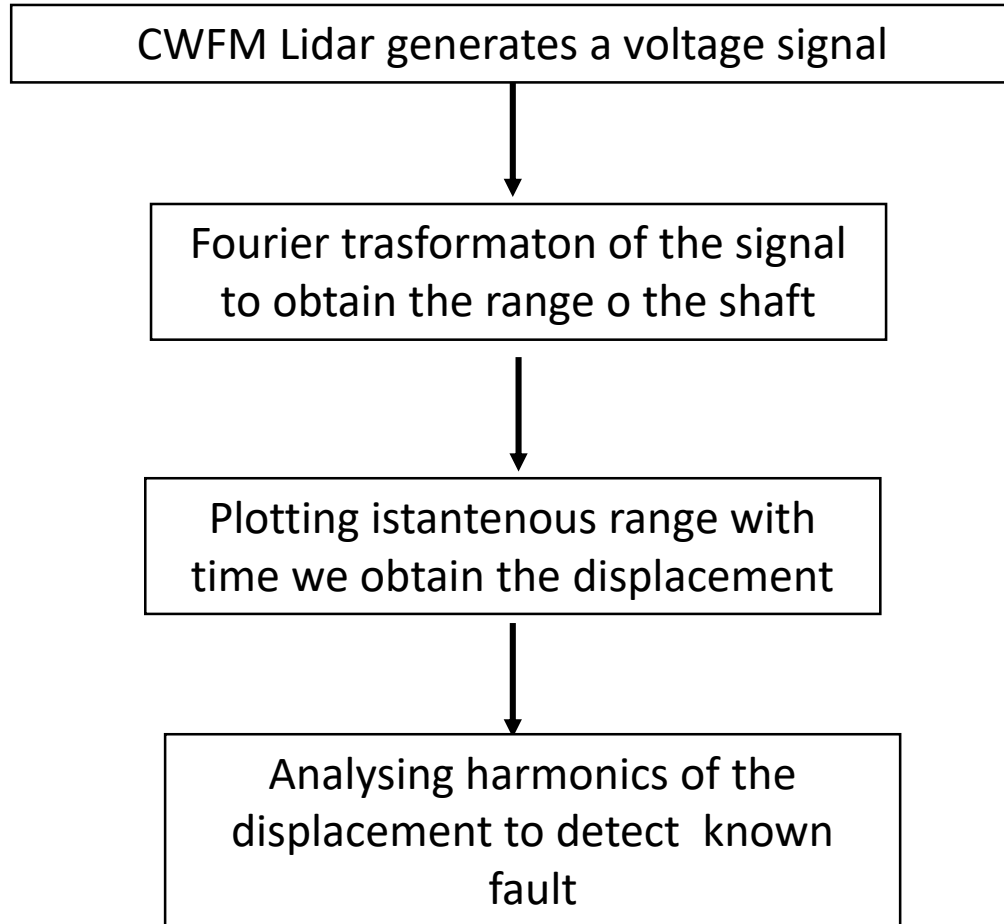- Non intrusive monitoring system
- Mostly independet from enviroment condition
- Retrace the fault

CONS:
- Exspensive
- More complex

LIDAR

PC

✓ GOOD

✗ BAD

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Process

CWFM Lidar generates a voltage signal

↓

Fourier trasformaton of the signal to obtain the range o the shaft

↓

Plotting istantenous range with time we obtain the displacement

↓

Analysing harmonics of the displacement to detect known fault

LIDAR

PC ✓ GOOD ✗ BAD

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Future applications and developments

Condition monitoring without contact with the object can be very useful when the motor is placed in hostile or not very accesable enviroment.

The data from the sensing components can be used for the control system of the motor, improving efficiency.

The health of the motor can helps to develop new predictive maintenance technique, reducing the costs of industrial installations.

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