



# Thesis Proposal

## Arduino and Raspberry Pi for Experimental Laboratory Structural Health Monitoring



**Politecnico  
di Torino**



### Contacts:

Prof. Giuseppe Carlo Marano

[giuseppe.marano@polito.it](mailto:giuseppe.marano@polito.it)

Ph.D. Marco Martino Rosso

[marco.rosso@polito.it](mailto:marco.rosso@polito.it)

# Experimental Physical Scaled Model

Material: Aluminium

Typology: Truss bridge system

Excitation: Scaled train passages

Plans: Mount a **sensing system** based on low-cost acquisition systems **ARDUINO** or **Raspberry Pi** for vibration responses and acceleration data collection.



# Step-by-step multi-disciplinary thesis planning

The current thesis project is multidisciplinary and may involve both **electronics, computer science students, civil engineering students, mechanical engineering students, etc.**

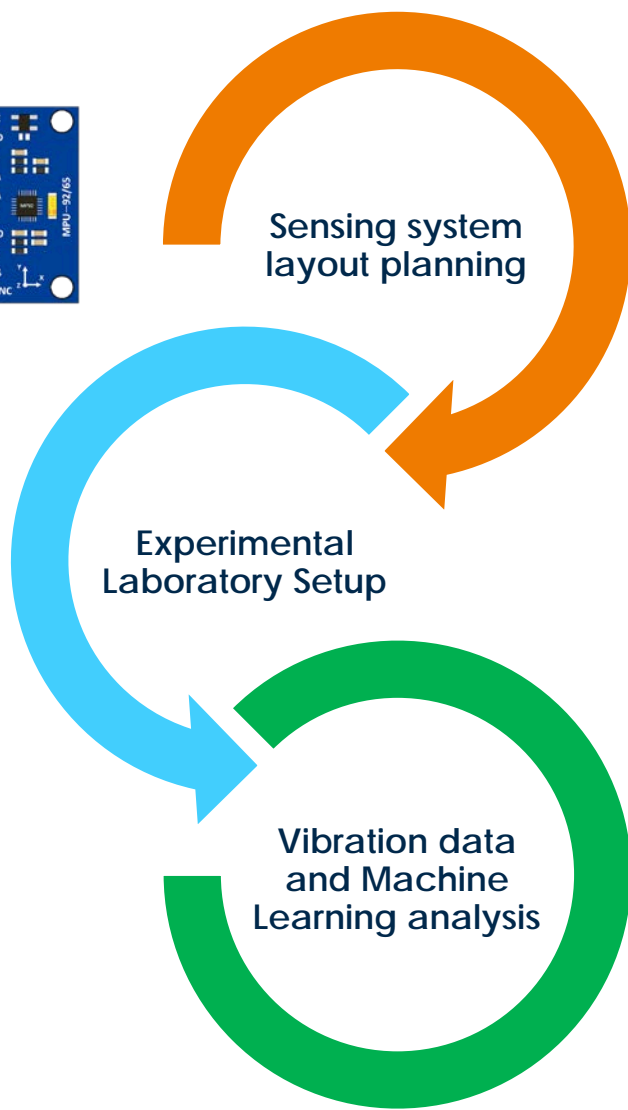
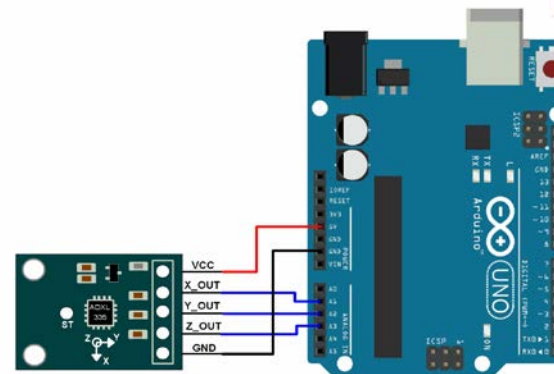
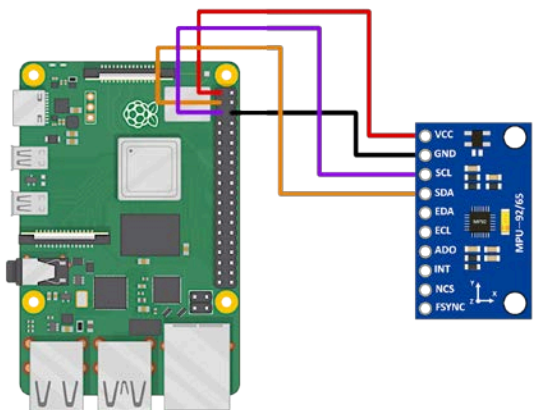
Its versatility permits a step by step process, and **a thesis for every different aspect can be done** by each student leveraging the **specific oriented background skills of every student** coming from different engineering courses.



Raspberry Pi

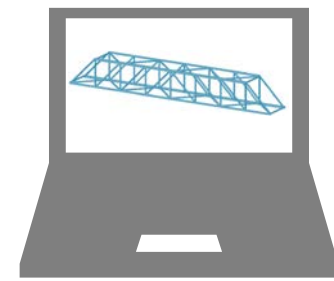


# Step-by-step multi-disciplinary thesis planning



Finite Element Model

Operational Modal Analysis



Model Updating

Modal Parameters Extraction

$$\Phi_i$$

$$f_i$$

$$\xi_i$$