FROM TEACHERS FOR TEACHERS

TECHNOLOGIES IN STEM EDUCATION

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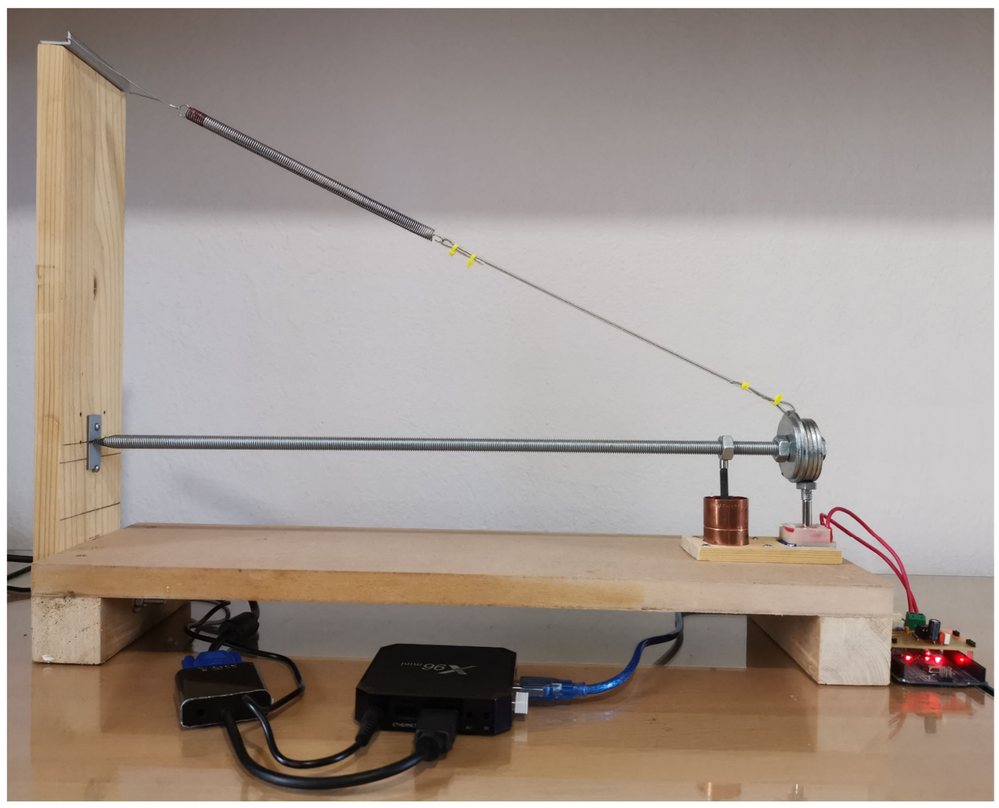
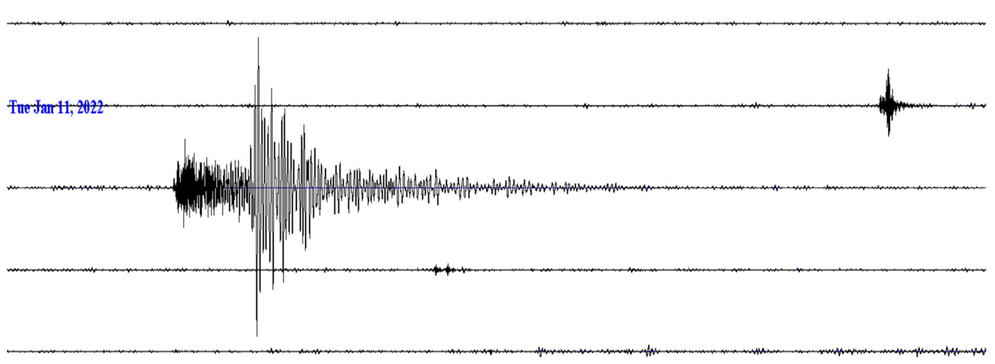
A simple yet sensitive seismometer

Our **seismometer**, which is capable of recording local earthquakes greater than 3R and teleseismic earthquakes greater than 6R, consists of a ground-motion detection sensor coupled with an appropriate recording system.

The **ground-motion detection sensor** is a mass-spring system combined with suitable electromagnetic and electronic devices to convert ground vibrations into electrical signals.

The **recording system** consists of an Arduino, to digitize and filter the seismic data and a computer running jAmaseis software, which receives the digitized seismic data and undertakes their recording, display, archiving and analysis. It also can send the data to the IRIS network, so that it can be accessed online by everyone.





Students can:

- Learn the basic points concerning the causes of earthquakes, the propagation and the differences of the different types of seismic waves.
- Recognize and understand the scientific principles on which the operation of a seismometer is based, i.e. issues from electromagnetism and oscillations.
- Deal with printed circuit board making techniques.
- Carry out experiments, to be able to adjust the device for proper operation.
- Install a Linux (Armbian) distribution on an Android TV Box, turning it into a system capable of "running" the jAmaseis software.
- Work like a real seismologist works, determining for example the epicentre of recorded earthquakes.

An active learning project to increase students participation and motivation and improve understanding and performance in STEM disciplines

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