

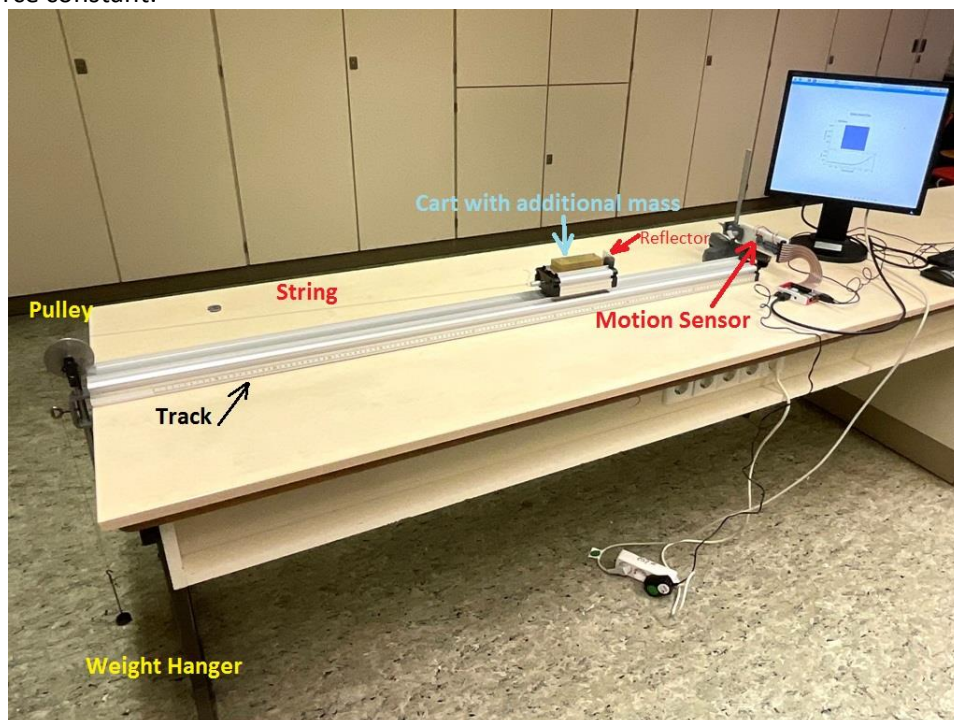
## Newton's Second Law

PhyPiDAQ  
Digital Measurement System Based on  
Raspberry Pi



### Objectives:

- Measure the position of an object against time by connecting the Time-of-Flight VL53L0X Motion Sensor at the Raspberry Pi and use the recorded data to determine the Cart's acceleration.
- Employ spreadsheets like LibreOffice or Excel to determine the mathematical equation which relates force, mass and acceleration in two experiments: a) increase the net force acting on the Cart while keeping its mass constant and b) vary the Cart's mass while keeping the net force constant.



*Experimental setup with the VL53L0X Distance Sensor to visualise and record the position-time graphs of a Cart of mass  $m$  under the influence of a constant force, which is the weight of hanging mass  $M$ .*

### Procedure:

-On the Graphical Interface of the PhyPiDAQ Software one has to configure the experiment according to the [VL53L0x\\_postion\\_vs\\_time.daq](#)  
-The Analog-to-digital convertor has to be configured according to the [VL53LxConfig.yaml](#).

### Measurements:

