An introduction to Tracker as tool for the teaching-learning process

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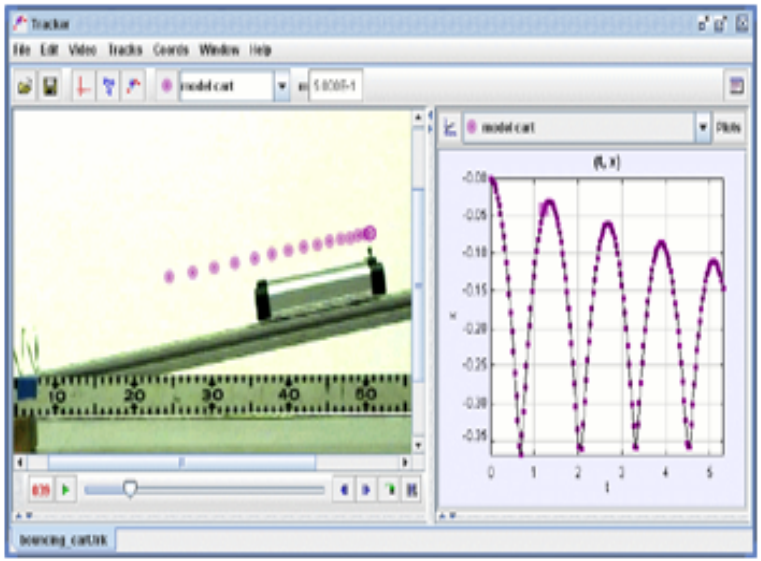
Introduction

Tracker is a FREE video analysis and modeling tool built on the Open Source Physics (OSP) Java framework. It is designed to be used in physics education.

Tracker
Video Analysis and Modeling Tool



https://physlets.org/tracker/

What is Video Modeling?

- Compare videos of the real world to animations of theoretical models.
- Students define force expressions, parameters and initial conditions for dynamic particle model simulations based on Newton's Second Law.
- Model simulations synchronize with and draw themselves right on the video.

Video Modeling Advantages

- Students build the model.
- Model testing is visual, not only mathematical.
- Focus is on how forces affect motion.
- Interactive process, instant feedback.
- Intuitive interpretation of results.
- Discrepancies lead to exploration.

What?

- Developed by Doug Brown (retired from Cabrillo College)
- Built with the Open Source Physics library by Wolfgang Christian
- Written in Java and uses the Xuggler video codec which opens Quicktime, Flash, avi, ...
- ***Runs across platforms:*** Mac, Windows, and Linux

Why?

- It's free
- It is actively developed and improved.
- Directly import videos from servers.

- Useful features include:
  - auto-track
  - track motion relative to a moving reference frame
  - calculate a dynamic model
  - tabs for different videos

Key Differences From Logger Pro

- Click CREATE to create a point mass that represents the object.
- Hold the SHIFT key to mark the position of an object.
- Right-click the graph to analyze.
- The Data Analysis tool is separate from Tracker's Main window.
- Save and open tabs in both Tracker and the Data Tool. Data Tool is like a separate application. You can open tabs from multiple experiments.

Six Steps for Video Analysis

1. Import the video (or image).
2. Set video frame rate and set start and end frames of the video.
3. Calibrate the video (i.e. set the scale).
4. Set the origin and orientation of the coordinate system.
5. Mark the video.
6. Analyze the data.

Our lab Plan

- Some example
- Make a video
- Upload it on pc
- Mark the motion of the object using manual-tracking and auto-tracking
- Analyze the obtained data

Grazie per l'attenzione

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