

# LON-CAPA

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# LON-CAPA

- **Course Management: 课程管理**
  - Post materials 教材
  - Homework assignments 作业
  - Grades 评分
  - Online discussions 网上讨论



# LON-CAPA

- Learning Content Management: 教材管理
  - Use same material in different courses 不同课可用同教材
  - Universities can share online content 大学间可共用内容



# Online Learning Materials

## 网上教材

- Web pages, animations, movies, etc  
网页，动画，影片等

**EXAMPLE**

**Example: Looping**

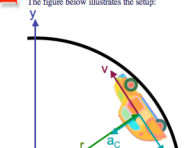

A toy car can go through a looping if it is fast enough. What are the forces that act on it? How fast does it have to be?

The motion is obviously circular, but non-uniform: the car will slow down on the way up, and speed up on the way down. With  $r$  being the radius of the looping, the  $x$ -axis horizontal, the  $y$ -axis pointing up, the origin being in the center of the looping, and  $\theta(t)$  being the angle, the position of the car is given by

$$\vec{r}(\theta) = \begin{pmatrix} r \cos(\theta(t)) \\ r \sin(\theta(t)) \end{pmatrix}$$

as long as it does not fall off the track.

The figure below illustrates the setup:

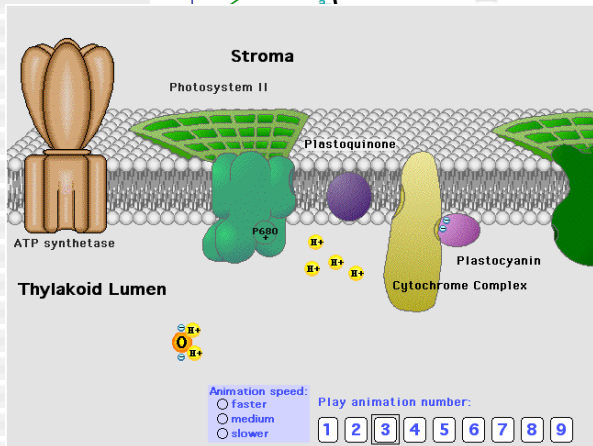
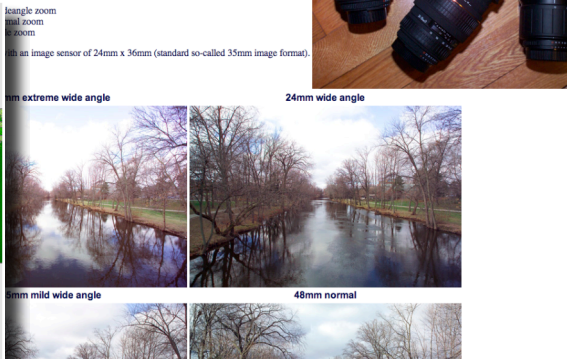
**EXAMPLE**

**Focal Length**

The following pictures are taken from the same vantage point with three different zoom lenses:

1x (wide angle) zoom  
2x (normal) zoom  
3x (telephoto) zoom

with an image sensor of 24mm x 36mm (standard so-called 35mm image format).



### Impedance

The addition of the three currents (through the resistor, the inductance, and the capacitance), each of which is 90° out of phase with each other, in quadrature yields:

$$\begin{aligned} V &= \sqrt{V_R^2 + (V_C - V_L)^2} \\ &= \sqrt{(I R)^2 + (I X_C - I X_L)^2} \\ &= I \sqrt{R^2 + (X_C - X_L)^2} \\ &= I Z \end{aligned}$$

where  $I$  is the current,  $X_C$  and  $X_L$  are the **capacitive** and **inductive** reactances, respectively, and  $Z$  is the **impedance**. Putting in the values of the reactances, we obtain for  $Z$ :

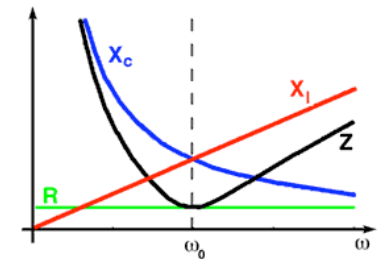
$$\begin{aligned} Z &= \frac{V}{I} = \sqrt{R^2 + (X_C - X_L)^2} \\ &= \sqrt{R^2 + \left(\frac{1}{\omega C} - \omega L\right)^2} \\ &= \sqrt{R^2 + \left(\frac{1}{2\pi f C} - 2\pi f L\right)^2} \end{aligned}$$

frequency and has its minimum of  $Z = R$  when

$$\omega_0 = (LC)^{-1/2},$$

of the pure LC circuit. This is the **resonance frequency** of the RLC circuit. The plot of the impedance and of the reactances is shown in the figure.

capacitive and inductive reactances in series have to be added in a special way. They end up as a single quantity  $Z$ , the AC equivalent of the **resistance**.



# Online Problems 网上作业

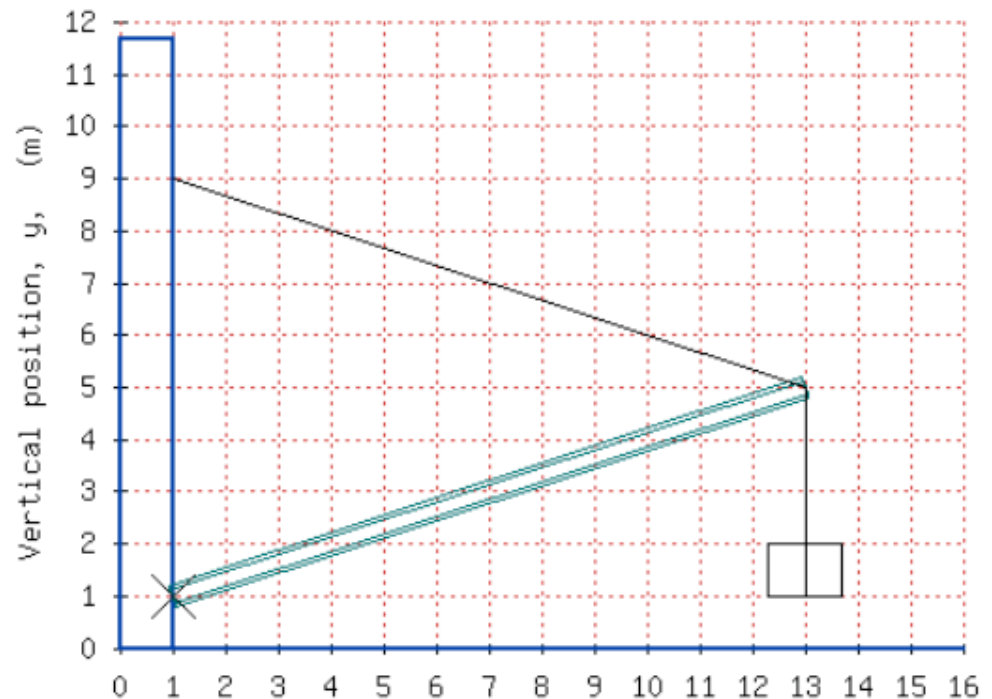
- Particular strength: online homework problems 特点：网上作业
  - Different students get different versions of the same problem 不同学生有不同的问题版本
  - Students can discuss how to solve the problems, but cannot copy answers from each other 学生可讨论怎么做，但不能互相抄答案

# Example: Online Problem

## 例子

- Different mass  
不同重量
- Different geometry  
不同角度
- Different answer  
不同答案

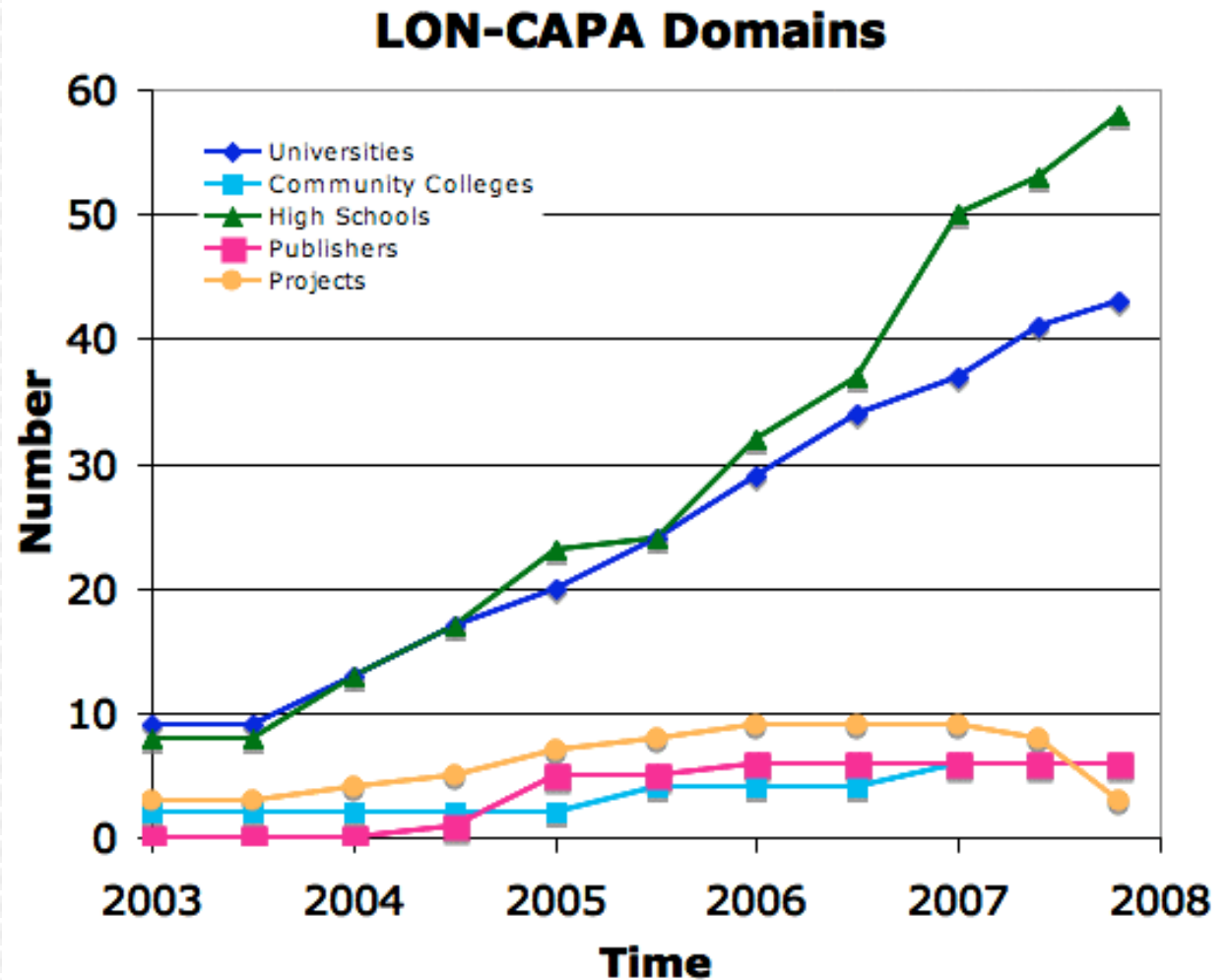
A crate with a mass of 155.5 kg is suspended from the end of a uniform boom with mass of 89.5 kg. The upper end of the boom is supported by a cable attached to the wall and the lower end by a pivot (marked X) on the same wall. Calculate the tension in the cable.



# Networked Institutions

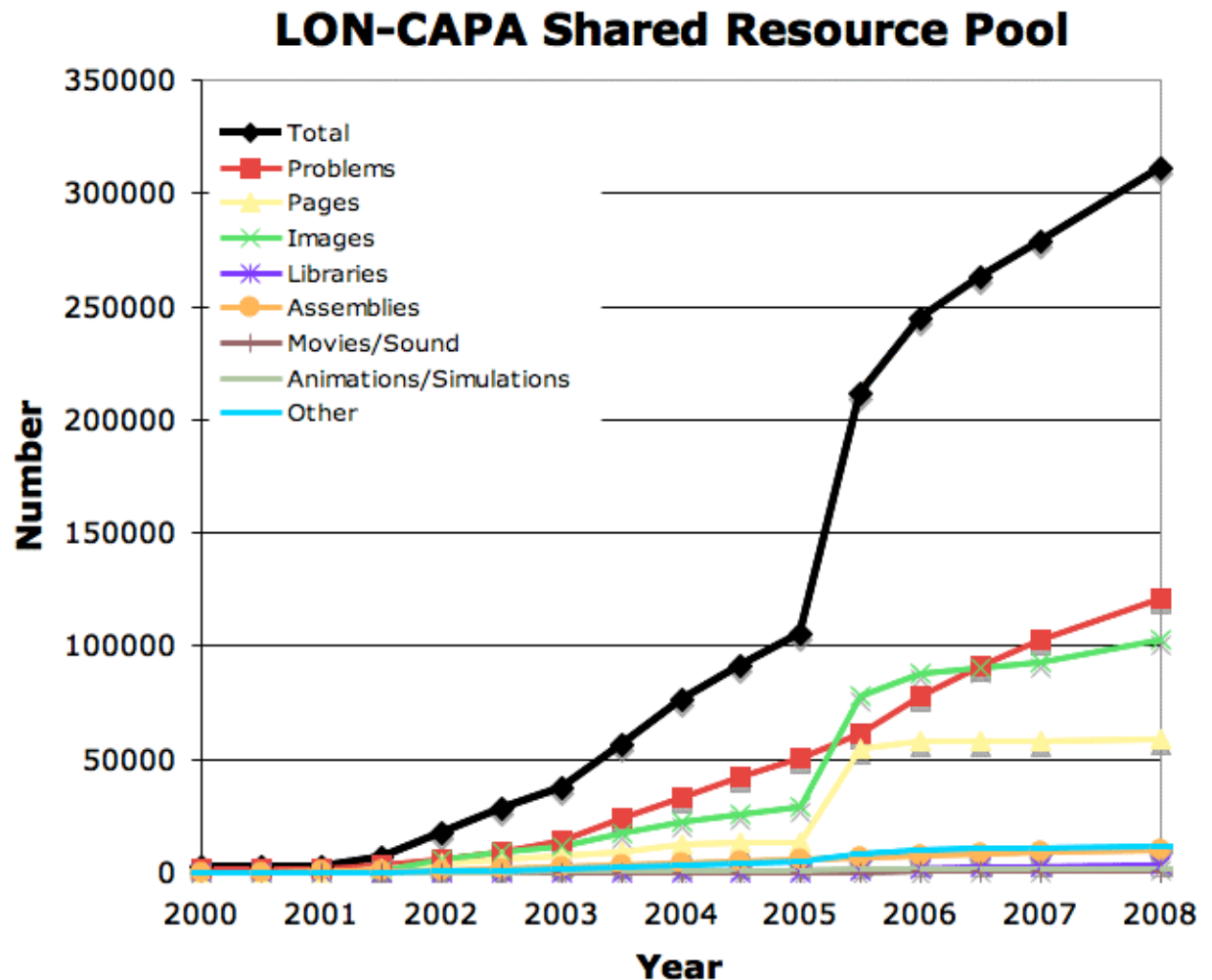
## 教育单位联盟

- Growth of user community  
联盟成长



# Shared Content 共用内容

- Growth of shared content pool  
共用内容之成长





# Open Source, Free 免费

- No licensing cost  
不用买许可证
- Universities can  
modify the software  
大学可更改软件



# Open Source, Free

- Interface can be translated  
界面可译成不同语言

The screenshot displays a web application interface with a yellow banner at the top that reads "Change Your Language Preferences". Below this, a browser window shows a "Remote Control" window and a navigation bar with links for "Home", "Bookmarks", "The LearningOnline ...", and "Welcome Set-Up Page". The main content area is divided into several sections:

- メインメニュー (Main Menu):** A sidebar menu with buttons for "ROLES", "DOCS", "NAV", "SPRS", "CHRT", "STAT", "ENRL", "CUSR", "PARM", and "RES", each with a corresponding description in Japanese.
- Importieren eines veröffentlichten Dokumentes (Importing a published document):** A section with a search bar, "Suchen" (Search), and "Importieren" (Import) buttons.
- Spezielle Dokumente (Special Documents):** A list of document types including "Neuer Ordner", "External Resource", "Kursüberblick", "Inhaltsverzeichnis", "Einfache Seite", "Einfache Aufgabe", "Formular zum Hochladen von Noten", "Schwarzes Brett", and "Meine persönliche Information".

At the bottom, there are buttons for "Remove", "Rename", and "Обновить" (Update).

# Thank You 谢谢

- Thank You 请多多指教
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