

# EE 491 WEEKLY REPORT 9

Date: 03/27/2016

Group number: DEC1616

Project title: Surveillance of dairy animals using a smartphone-based system

Advisor: Meng Lu

Team member:

Xin Tong

Di Zhao

Tianqi Luo

Le Wei

## Weekly Summary

In this week, we are continue to design the good model for optical design. On the other hand,

we are continue to do our own part presentation and we practice with our mentor and

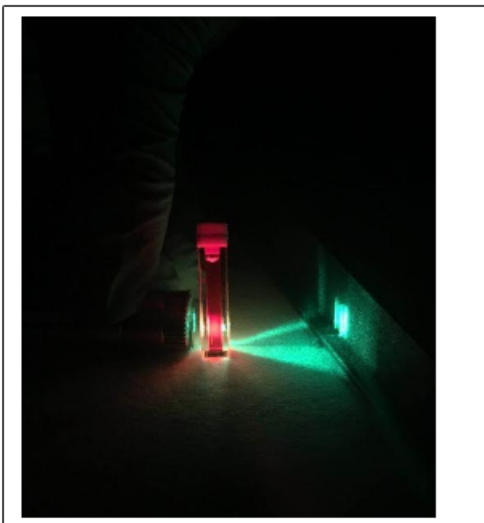
instructor.

## Past week accomplishments

- A. Di Zhao: Did the PPT for her parts.
- B. B. Xin Tong: Did the presentations for the introductions
- C. Le Wei: Did his own part ppt.
- D. TianQi Luo: Did some analyze for the FP assay,  
Did the own part PPT

## Individual contributions:

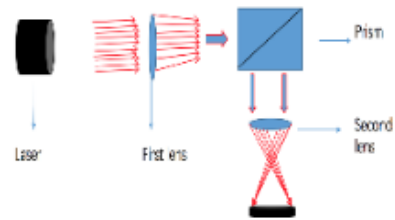
### Tianqi Luo:



## Di Zhao: (three slides for the power point)

### The Introduction Data For Every Components

- The first lens: we want to gather more lights, but do not want change their locus too much. thus we pick the lens with 10mm radius, and 20mm focal length.
- In order to let "o" light and "e" light to be parallel, we made the prism with 1cm length and 2cm width.
- we want these two light aggregate to two beams, thus the focal length must very small.
- we pick the convex lens with 10mm radius and 10mm focal length.

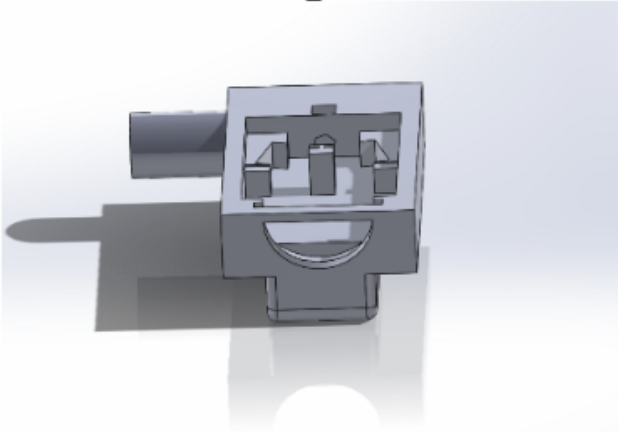


According to the optical design database, we use the **SOLIDWORKS** to design the 3D model.

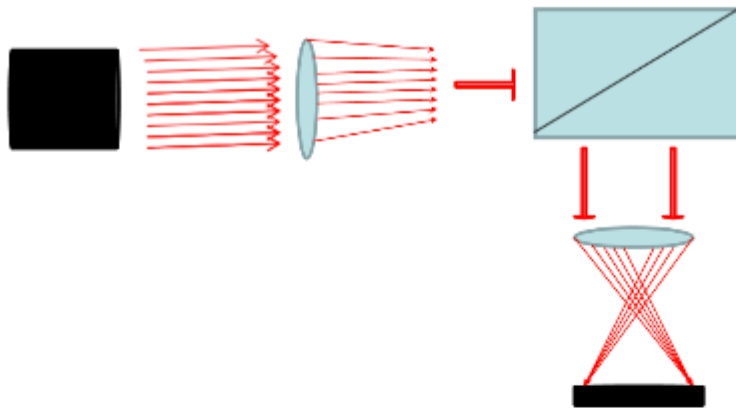
SOLIDWORKS is the most popular 3D Software tools to let us create, simulate, publish and manage our data. It helps our products better, faster and more cost-effective.

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## The Model Design in the Solidwork

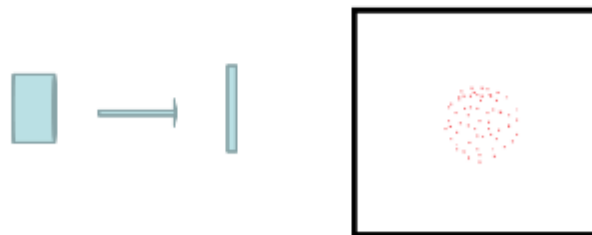


## Ideal optical design



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•A laser is a device that emits light through a process of optical amplification based on the stimulated emission of electromagnetic radiation.



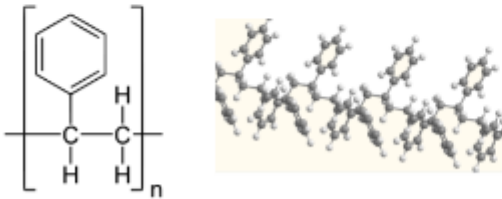
•The red laser has a longer wavelength than others(660 & 635 nm) . And it can supply 1-5mW power (it is enough to excite the fluorescence molecular). thus we choose the red laser pointer.

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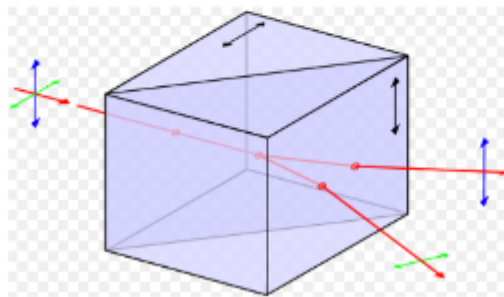
- In order to get more lights or reduce the lossing of lights, we add a convex lens here.



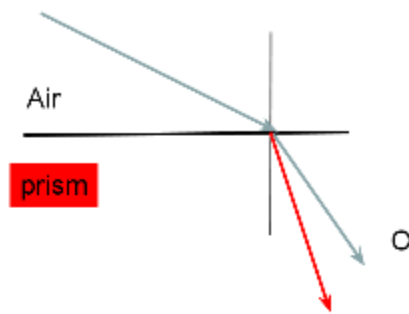
- this is a kind of plastic lens made of polystyrene (PS). And its index of refraction is 1.5500.



- It named Wollaston prism. It can separate randomly polarized or unpolarized light into two orthogonal linearly polarized outgoing beams.



How it works ?



when the unpolarized into this prism by  $45$  degrees, the optical axis will be vertical with the prism. then it will produce a "o" light which is vertical polarization with optical axis, and a parallel polarization which is "e". light o has a higher speed than e.

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- this part is the camera of Iphone, we use iphone two capture these two beams. And then use the APP to analyze them.



<u>NAME</u>	<u>Individual Contribution</u> <u>s</u>	<u>Hours this week</u>	<u>HOURS cumulative</u>
A	Xin Tong	6	63
B	Di Zhao	7	61
C	Le Wei	8	69
D	Tianqi Luo	7	70

### **Comments for this week**

This week everyone focus on the own part power point and we are continue to get the good solution for the optical design, Wei Le learned another design tools to get the good solution for the optical design.

### **Planning for next week:**

- A. Xin Tong: get the good way to change the code.
- B. Tianqi Luo: Did more analyze for the FP assay.
- C. Le Wei: Through the new optical design to get the good solutions for the design.
- D. Di Zhao: collect the data from Wei Le's part to get the 3Dmodel.

### **Group task:**

**Edit our own Power Point through advisor's suggestion, continue for the next Friday's work.**

### **Summary of weekly advisor meeting:**

Last week, we are gave our advisor Lu Meng and mentor the first presentation at the Cover Hall 2222, and the end of the presentation the advisor gave us some suggestions for the slides, we should edit almost slides and got more practice.