

02 Overview 1

Tuesday, January 11, 2011
5:10 PM

Today:

Admin

Finish First Assignments

Start Overview: Choices in imaging

Admin:

- Put signed Use Agreement, Syllabus Agreement, on piles up front.
- Reminder, ITLL orientations: For after-hours access and computer login, attend a 1/2 hr tour. Find out what resources are here, agree to not spill drinks on the keyboards. M-Th 5:05 pm, in front of the ITLL office next door. Reservations recommended but not required.

- Cameras:

Mike's Camera (Folsom and Pearl) suggests

Canon SX130 -

http://www.usa.canon.com/cusa/consumer/products/cameras/digital_cameras/powershot_sx130_is#Specifications

Or the Panasonic Lumix ZS5 -K.S

http://www2.panasonic.com/consumer-electronics/shop/Cameras-Camcorders/Digital-Cameras/Lumix-Digital-Cameras/model.DMC-ZS5K.S_11002700000000000005702#tabsection

Costs:

38089 CANON POWERSHOT SX130IS - \$249.99

30011 #PANASONIC DMC-ZS5S 12.1MP - \$279.99

How many of you are planning to buy a camera this semester?

Pasted from <<https://mail.google.com/mail/?ui=2&view=bsp&ver=ohhl4rw8mbn4>>

<<file:///C:/Users/hertzber/Documents/01CLASSES/FlowVis/Equipment/Cameras2010.xlsx>>

POST
SURVEY

- Lecture notes will be posted on the Flow Vis site. Feel free to nag me.

First Assignments

Move the Best of Web due date to
Wednesday 1/19

<http://www.colorado.edu/MCEN/flowvis/course/schedule.pdf>

<http://www.colorado.edu/MCEN/flowvis/course/initialassignments.pdf>

Overview 1: Topics will be presented iteratively.

Previsualization: Have a goal, think about what you want it to look like.

Make CHOICES:

1. Flow phenomenon: Water boiling? Faucet dripping?
2. Visualization technique: Add dye? See light distorted by air/water surface?
3. Lighting (source of worst image problems)
4. Image acquisition: Still? Video? Stereo? Time lapse?
5. Post processing, final output. Edit, at least crop the image, consider contrast.

1. Flow phenomenon: Why does it look like that?

What are the forces? = a framework for interpretation of the image

Minute paper. In groups (3 or so) list all the forces that can act on a fluid. Write on a scrap of paper. No names needed.

Got to here 1/12/11

All forces can be categorized like this: 2 flavors of forces

←
Body

Acts on every molecule equally

- a) Gravity
- b) Electromagnetics

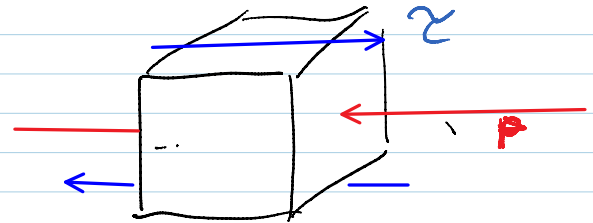
<http://www.youtube.com/watch?v=fAbycqD2UmQ> Protrude Flow
Ferromagnetic fluid (ferrofluid). Iron nanoparticles suspended in oil, follows magnetic field lines.

http://www.colorado.edu/MCEN/flowvis/galleries/2010/Team-2/FV_popup1-16.htm

Expensive, but you don't need much (\$30)
Check Ebay, Craig's list

↓
Surface

Acts on the surface of a volume of fluid



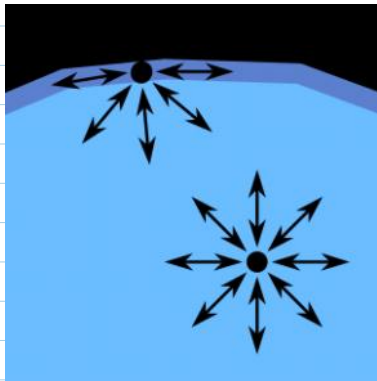
P Pressure: always perpendicular to surface

τ Shear: always parallel to surface

Any surface force can be decomposed into a shear plus pressure

Note: these are actually STRESSES = Force acting on an area.

The only force that is not so easily categorized is SURFACE TENSION



It's the result of intermolecular forces, so it affects every molecule, like a body force

But it is only obvious at interfaces between fluids, kind of like a surface force.

<http://upload.wikimedia.org/wikipedia/commons/thumb/f/f9/Wassermolek%C3%BCleInTr%C3%B6pfchen.svg/300px-Wassermolek%C3%BCleInTr%C3%B6pfchen.svg.png>

<http://www-math.mit.edu/~dhu/Striderweb/striderweb.html>

Water-walking insects

Conclusion: Whenever you are observing fluids, list the forces that may be acting, **that make it look like that.**

Examples? Let's look at

<http://fuckyeahfluidynamics.tumblr.com/>