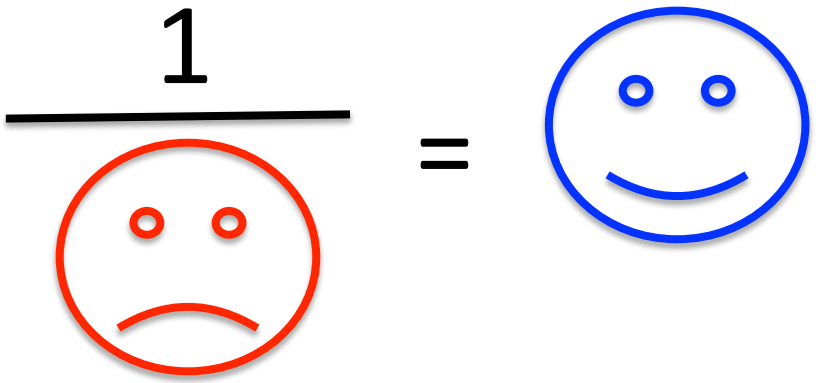

2.70/2.77 Week 3

Spring 2017

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Week 3 Theme: FUNdaMENTALS of deterministic design

- **Week 3:**
- *Reading: FUNdaMENTALS Topics 7, 8, PMD Chapter 3, 4*
- *Brainware:*
- After building and testing your kinematic coupling designed last week, evolve your initial spreadsheets to predict performance.
  - This is closing the loop on your designs and helps to build design intuition
- Evolve your linear motion axis design and make part drawings.
  - Design in where the actuator will go
- Seek & Geek Exploration
- Update website
-
- *Hardware:*
- Make and test your linear motion system (does not have to include actuator).
  - Use a mounted laser pointer to test and record change in position on piece of paper placed far away

Next Week 4 Theme:

- **Week 4**
- *Reading: FUNdaMENTALS Topics 9, 10, PMD Chapter 5, 6*
- *Brainware:*
- Based on last week's results, evolve linear motion system design (if needed) so this week you can mount and test the actuator
- Now that you have a single axis system, use what you have learned to layout concepts for the full machine
  - Create stick figures for concepts
  - Assign errors (error apportionment) and create preliminary error budgets for "best" concepts
  - *Make sure to DESIGN it (write the spreadsheet—predict performance and size elements)*
- Seek & Geek Exploration
- Update website
-
- *Hardware:*
- Modify the linear motion system as needed so you can mount and test the actuator in the system.
  - Use a laser pointer mounted to it and record change in position on piece of paper placed far away
- How do results differ from last week?

Laying out the design using FUNdaMENTALS

- Axis error apportionment gives us “hunting license”
- Thought process:
  - FRDPARRC
  - PREP
  - Preliminary calculations of structure and bearings
- Strategies
  - Desk:
    - Wall mount
    - Desk mount
    - Freestanding
  - While thinking of some concepts
    - Rotary joints
    - Linear joints
    - hybrid