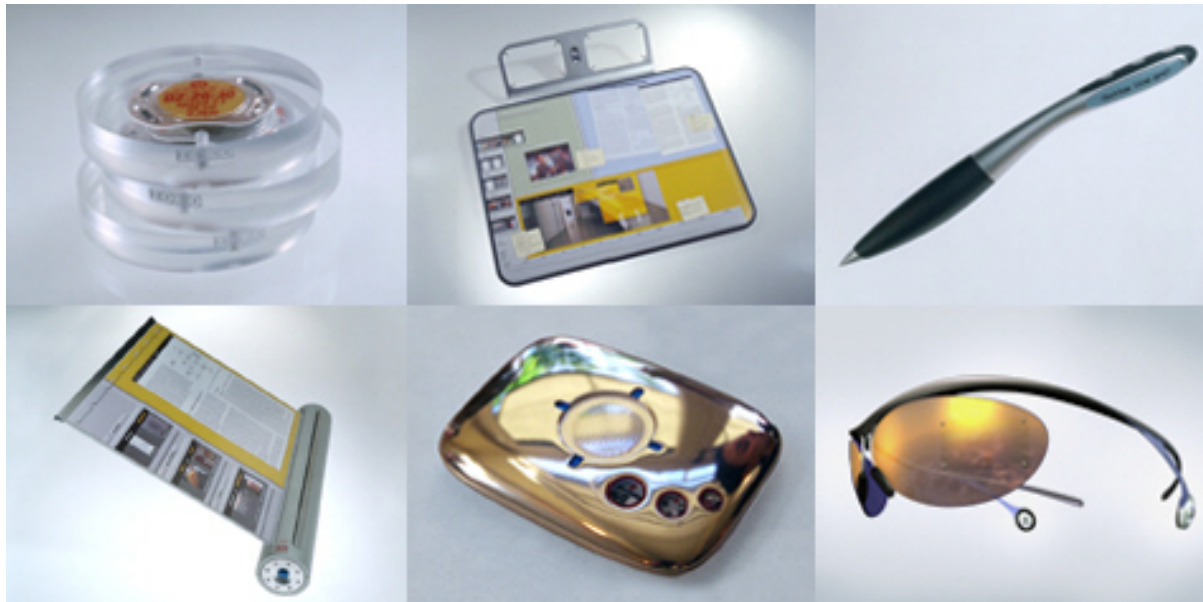


# CMSC 498D

## Introduction to Rapid Prototyping Techniques



Future interactive devices from IDEO

François Guimbretière  
CSIC 1121 Tue-Thu 2:00 - 3:15

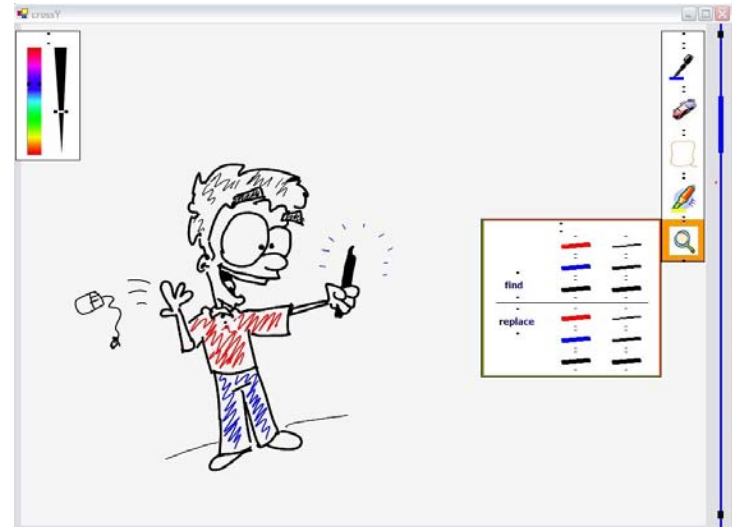
# CMSC 498D Administrivia

- Instructor
  - François Guimbretière
    - *Human computer interaction*
      - Paper based computing
      - Pen based interactions
      - Information Visualization
    - *Office hours (Room 3267 AVW):*
      - Tue/Thu 10:00am – 11:00am
      - *or* by email any time: francois@cs.umd.edu
      - *or* by appointment

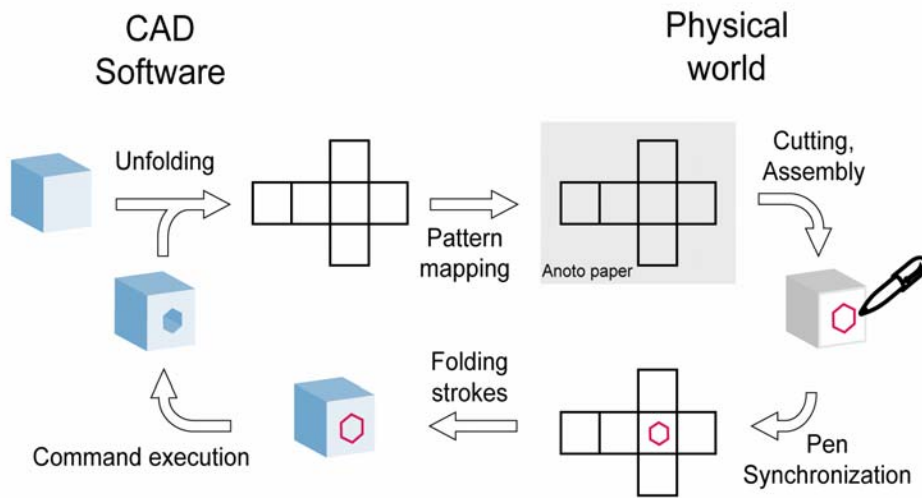
# Sample projects



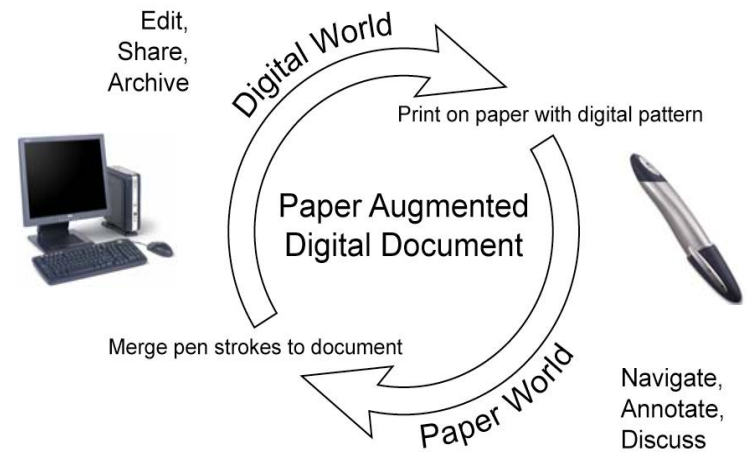
Stanford Interactive Mural



CrossY



ModelCraft

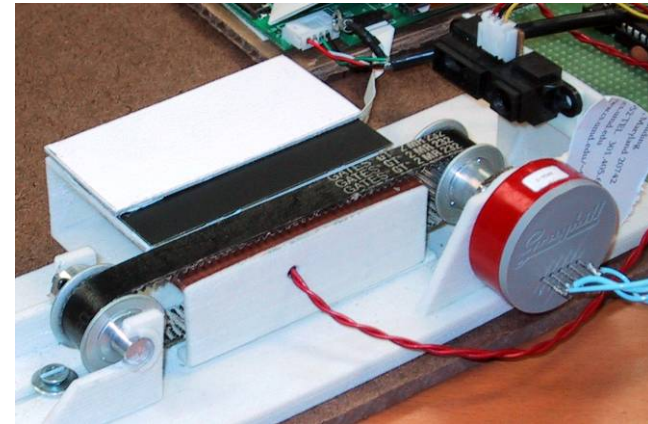


PADD/PapierCraft

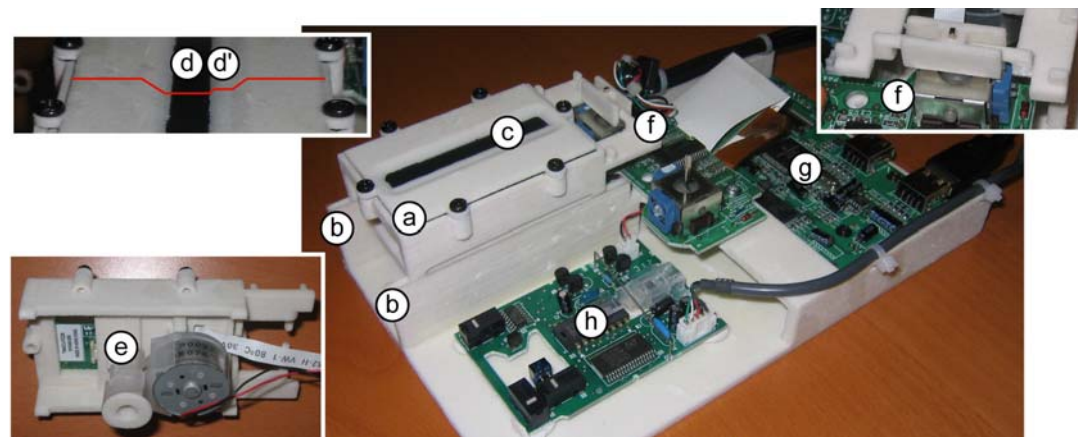
# Sample prototypes



Stanford Interactive Mural



Hardware scrollbar #2



Hardware scrollbar #1

# Student info

- Name, e-mail
- Are you taking the class for credit?
- Why are you taking the class?
  - Goals
  - Topics you would like to be covered in the class
  - Projects you have in mind
- Background?
  - Do you know how to solder?
  - Have you build electronic circuits before?
  - Have you programmed a microcontroller before?
- Additional comments

# What you will learn

- How to get started
  - Understanding the problem at hand;
  - Finding possible solutions and selecting good solutions;
- Rapid prototyping techniques
  - Building low fidelity prototypes;
  - Building medium fidelity prototypes with a laser cutter;
  - Building high fidelity prototypes with a 3D printer;
- Electronic
  - Using microcontrollers
  - Basic electrical circuits
  - Printed circuit board (PCB) production and testing
  - How to use datasheets

# How you will learn

- By doing (and reading)!
  - Show and Tell exercises
- By participating
  - Sharing your experience with others is very important
  - Creation of “How to...” pages
    - *Use for the “Invent the Future” teams*
- By collaborating
  - Show and Tell
  - Projects are group activity
    - *Be sure to have group members from different background*
  - Make good use of office hours

# Work load

- Reading
  - Manuals, textbooks and papers
  - ~ 2 papers per class
  - Readings are considered understood if no questions are asked
- In class presentation and discussion
  - Heavy participation is expected
  - Project presentations
- Show and Tell
  - Small hands-on homework
- Project
  - 1 project, 3 checkpoints
  - Project proposal due Feb 1

# Resources available

- 3D printing
  - ZPrinter 310
- Laser cutter
- Electronic lab
  - PCB production
  - Mixed signal oscilloscope
  - Micro-controller programming station



# How you will be evaluated

- 10% Participation
  - 20% Show and Tell
  - 70% Final project
- 
- Check the syllabus about academic Honesty

# Texts

- Texts used during the class
  - Books will be available in the CS library or online when ever possible
  - **FAB: The coming revolution on your desktop: from personal computers to personal fabrication.** (N. Gershenfeld), 2005;
  - **Practical Electronics for Inventors** (Paul Scherz, 2nd edition), 2006;
  - **Physical Computing: Sensing and Controlling the Physical World with Computers** (Tom Igoe and Dan O'Sullivan), 2004);
  - **Getting Started in Electronics** (Forrest M Mims III), 2003;
- Course web sites:
  - <http://www.cs.umd.edu/class/spring07/cmsc498D/>

# Hardware

- Required before the end of Feb
    - PIC-P40-USB prototype board
      - [www.sparkfun.com](http://www.sparkfun.com) or [www.microcontrollershop.com](http://www.microcontrollershop.com)
    - PIC 18F452 microcontroller
    - MCP4821 12 Bit DAC
    - TC74 temperature sensor
- } [sample.microchip.com](http://sample.microchip.com) (sample)  
} [www.microchip.com](http://www.microchip.com) (buy)