

# Special Topics in Design I

## DSL 810

### Topic 8

# Interface and Application Programming

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# Announcements

- Project reimbursements
- Please upload assignment 5 on input devices and 6 on output devices
- Please start documenting your project – for your portfolio, we know the challenges you are facing, for inspiring others with your good work.

# Interface and Application Programming

- [Fab Academy Video](#)
- MIT App Inventor for Mobile App making [Example](#)
- Processing for Desktop App making and interfacing with Arduino [Example](#)

# MIT App Inventor

- Cloud based tool to develop apps for android
- Developed by Google and maintained by MIT Media Lab, CSAIL MIT
- Develop UI in Designer Editor and program it in Blocks Editor
- Login to <https://appinventor.mit.edu> using gmail account
- Lets get started! [Beginner Tutorials](#)

# Bee buzzing App

- Graphical Programming
- Flowchart based programming
- Event based programming
- Designer Editor, Blocks Editor
- Changing the sound mp3
- Testing using the Emulator OR
- MIT AI2 Companion App with similar WiFi network
- Build - download and install apk file on Android Phone – your first App!
- File Names – only numbers, letters, underscores.
- Changes sound, image, other changes.

# Text to Speech (Talk to Me) App

- Text to Speech [Video1](#)
- Accelerometer sensor [Video2](#)

# GPS App

- Location Sensor [Video3](#)
- Building a GPS App [Video](#)

# Ball Bounce App

- [Video](#)



# Digital Doodle App

- [Video](#)
- [More tutorials](#)

# Mobile App with hardware interaction

- Mobile App for Bluetooth with MIT App Inventor
- In Bluetooth, please remember to disconnect Rx, Tx pins when you upload code to Arduino, baud rate should be 9600.
- Bluetooth connections [Link1](#) [Link2](#) [bluetooth v5b.ino](#)
- Send and receive data with Bluetooth [Link](#) [bluetooth v6.ino](#) for temperature, RH sensor.
- Multiple screens [Link](#)
- Open my project .aia file.
- Build Mobile App .apk file

# Processing

- [Graphical programming language](#) –visual design, images, creative applications
- [Youtube tutorials](#)
- Extendable through libraries (written in Java)
- Use for creating GUI for Arduino projects. For visualizing the output from sensors.
- [Other applications](#): Motion graphics, Data visualization

# Processing examples

- Writing simple programs
- [Processing functions reference](#)
- Setup, draw, events, random, other functions
- Processing examples
- [Generative Art](#) [Moonlight](#) [Other examples](#)
- Arduino + Processing (Button.ino, process\_input.pde)
- Ultrasonic sensor [Tutorial](#) [Processing code](#)
- Music Visualizer [Link](#)
- [Arduino+Processing Code](#) [Video](#) [Library](#) control LEDs
- [Arduino+ Processing another Link](#) control potentiometer
- Throttle change [Link](#) [Video](#)
- Scratch examples – animation, creative computing

# Excel VBA

- How are software made? How do you build GUI (frontend and backend) for software?
- GUI for building software for prototyping.
- Creating software for conducting surveys.
- Writing simple code
- Creating a form
- Command button, Text Box, Image, drop down list
- Writing text on a spreadsheet
- Multi-page
- Recording macros
- Same holds for Word VBA

# Assignment

- Please build a Mobile App that interacts with sensors from your smart phone.
- Please build a User Interface (Mobile App/Desktop App) that interacts with an input and/or output device using a microcontroller. Please document this work.
- Assignment deadline 14<sup>th</sup> November

# Announcements

- Major Test + Ppt. = 21<sup>st</sup> November, 3 pm-7 pm?
- Please also bring all the sensors that you have and are not using for your project/assignments.
- Please finish all the assignments by 14<sup>th</sup> November.