

# Interaction

Shiffman Chpt. 3

## Interaction

- Make your program respond to the user or other events
- Processing really shines here

## Event-based Programming

- Model for program organization
- User input occurs, program responds to it
  - Could be machine event
- Events (input activity):
  - Mouse click, mouse movement, video frame received, key press
- Callbacks (program response):
  - Methods associated with an event
  - Respond to input:
    - Update state, perform an action, etc.

## Event Examples So Far

```
■ setup()
  ➢ Startup "event"
■ draw()
  ➢ Refresh "event"
■ mousePressed()
void mousePressed()
{
  save("snowman.jpg");
}
```

## frameRate() (An Aside...)

- `frameRate()` sets the **max** frequency `draw()` will be called at
  - If processor cannot handle this, actual updates will be slower
  - Default is 60 fps (frames per second)
- Add to setup to control frameRate e.g.:  
`frameRate(30);`

## Simplest Sketch

```
void draw()
{
  ellipseMode(CENTER);
  fill(255);
  ellipse(mouseX, mouseY, 20, 20);
}
```



## Shortcomings?

- Can't start and stop drawing
- Can't make continuous lines
- Can't erase or clear
- Can't change brushes

## Connected Lines

- Two new variables defined by processing

➤ pmouseX, pmouseY

- Previous location of mouse in x and y

```
void draw()
{
    line(pmouseX, pmouseY, mouseX, mouseY);
}
```

## Processing Supports Many Input Events

- See "Input" section of reference

## Mouse Input

- Methods

mouseClicked()  
mouseDragged()  
mouseMoved()  
mousePressed()  
mouseReleased()

- Variables

mouseX  
mouseY  
pmouseX  
pmouseY  
mousePressed  
mouseButton

## How can I make it only draw when I want it to?

- Use mouse click to put pen down
- Move drawing code to mouseDragged
- Why not mousePressed?

## Keyboard Input

- Methods

keyPressed()  
keyReleased()  
keyTyped()

- Variables

key  
keyCode  
keyPressed



### Key Presses to Add Control

- “r” for red
- “g” green
- “b” blue
- “c” for clear

### Different Types of Input

- Mouse
- Keyboard
- Kinect
- Video Camera
- Environmental Sensors
- Light Sensors

### Complex Example

- Eye tracking
- Mouse clicking
- Color change