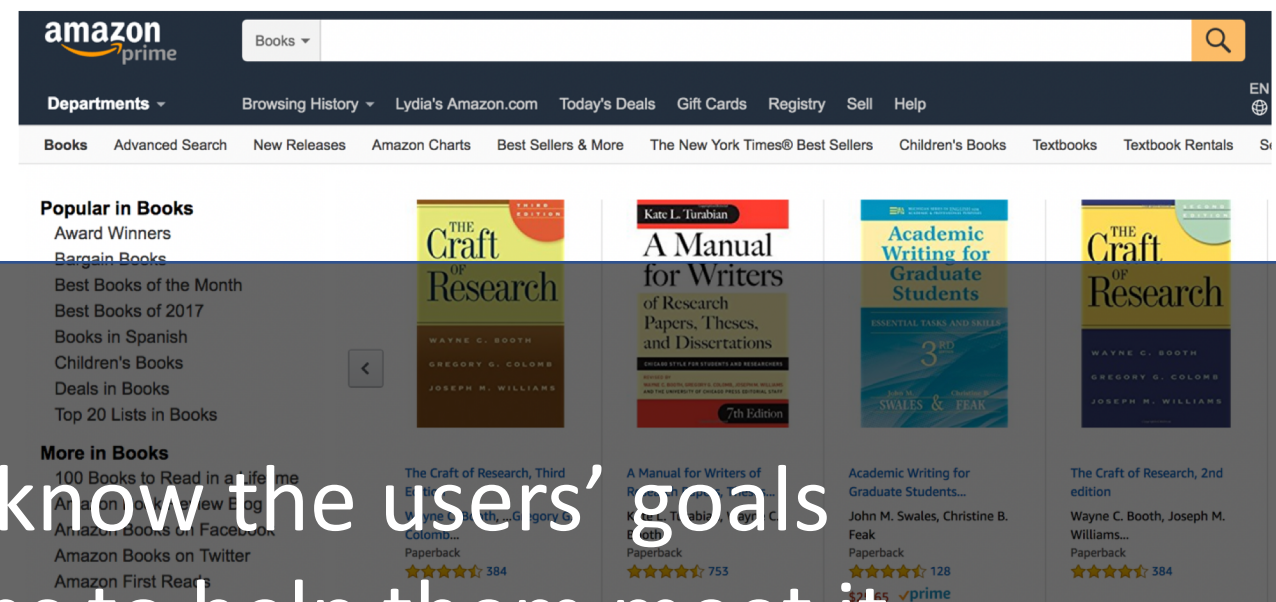
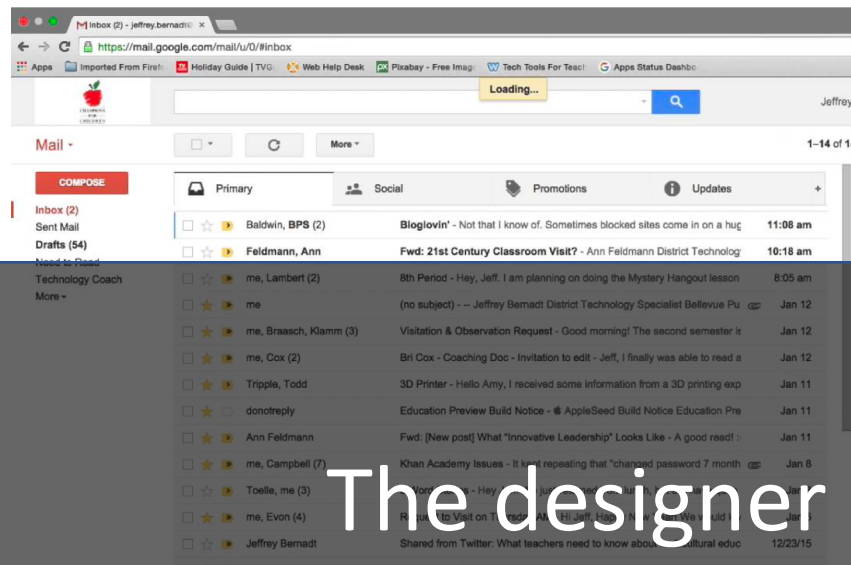


# Events and Feedback

Prof. Lydia Chilton  
COMS 4170  
5 February 2024

# Users interact with a system to accomplish a goal



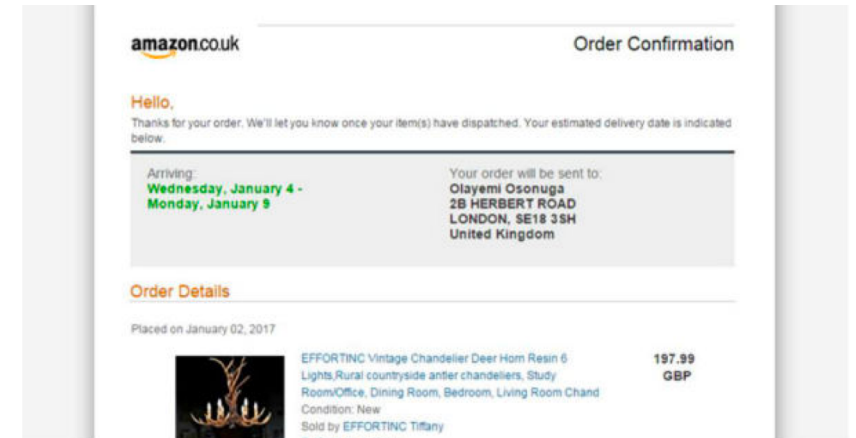
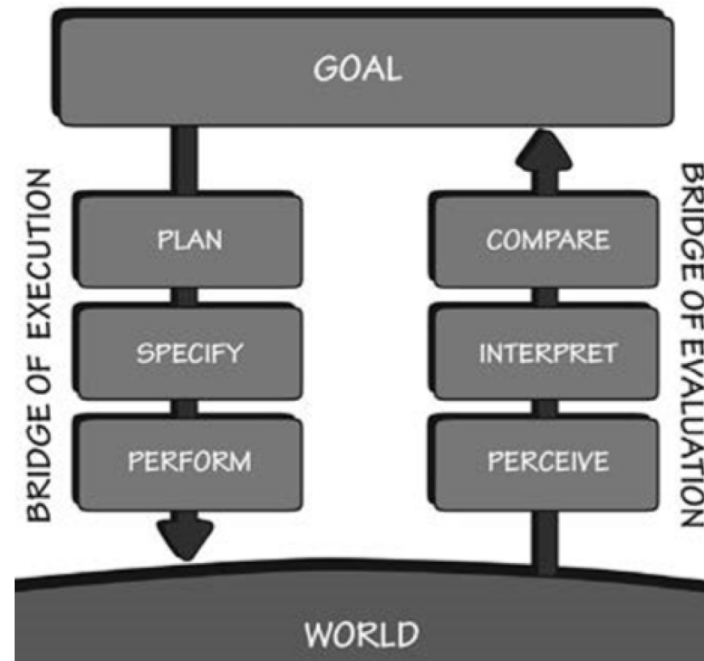
The designer must know the users' goals and create interactions to help them meet it.

To read and respond to all email.

To buy a book



To accomplish a goal, users must **execute** an operation and **evaluate** the result



To help users **evaluate the result**, designers must provide **feedback**.

Without feedback,  
what goes wrong?

What goes wrong when there is **no feedback**?



**Feeling:** **Confusion.** Users wonder whether their goal has been achieved.

**Action:** They continue to **expend extra energy** to accomplish the goal.

# What goes wrong when there is **too little feedback**?

## Submit Credit Card Payment

---

### Order Summary

Total  
**\$412.97**

Items

Description	Category	Qty	Unit Price	Amount
Mobile device for demos	Hardware	2	\$150.00	\$300.00
Video software upgrade	Software	1	\$50.99	\$50.99
Device accessories	Miscellaneous	2	\$30.99	\$61.98
			Total	\$412.97
				5 items

### Payment Information

**Information incorrect**

Card Number \*

Expiration Date \*

CCV \*

[PLACE YOUR ORDER](#)

Credit card transactions are handled by our secure payment processor. We do not store your credit card information.

When you click the 'Place Your Order' button, we'll send you an email message acknowledging receipt of your order. Your contract to purchase an item will not be complete until we send you an email notifying you that the item has been shipped.

[CONTINUE](#)

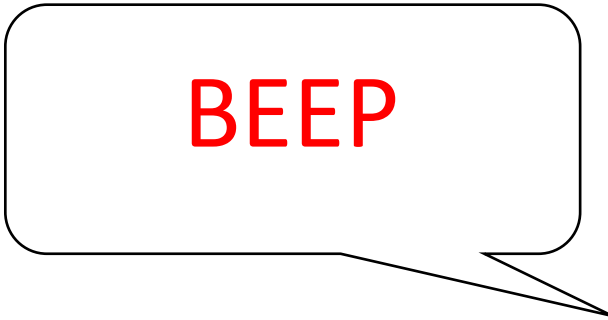
**Feeling:** **Frustration**. Users **don't know what** went wrong.

**Action:** They continue to **expend energy** to **figure out what to do**.

else



What goes wrong when there is **too little feedback**?



**Feeling:** **Anxiety**. Users don't know if the feedback if it's important.

**Action:** They continue to **expend energy** to figure out if it's important.



# What goes wrong when there is **too much feedback**?



I am now booking your flight

I am now using Google flight search

I am now typing JFK into the departure location

I am now typing LAX into the arrival location

I am now selecting February 26, 2018 from the departure date box

I am now confirming the date I just selected from the Departure date box

**Feeling:** **Annoyed** at being interrupted by irrelevant information.

**Action:** They **ignore all the feedback**.

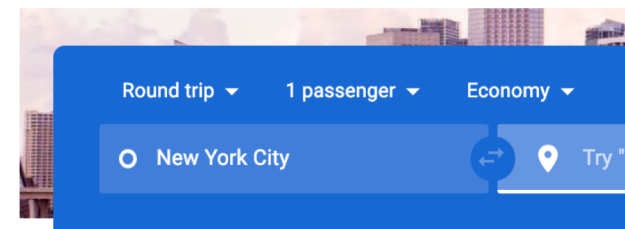
# What goes wrong when **feedback is too late**?



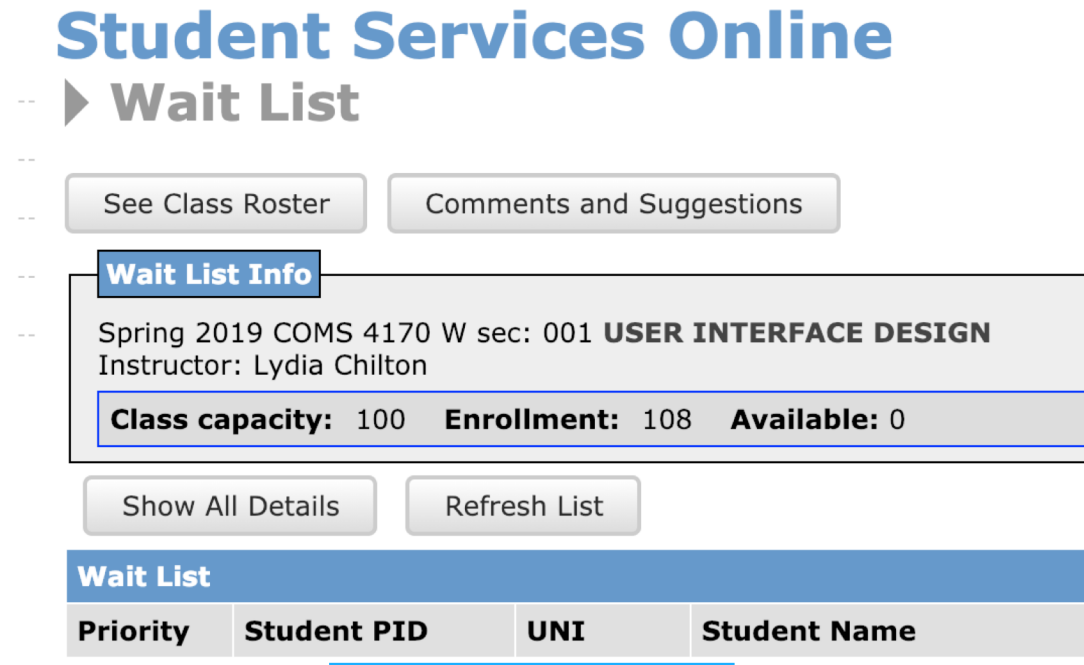
By the way, I booked that flight you asked for yesterday!

**Feeling:** **Uncertainty**. They're not sure anything happened.

**Action:** They **find another way** to reach their goal



# What goes wrong when **feedback is not continuous**?



The screenshot shows a web interface for 'Student Services Online' with a 'Wait List' section. It includes buttons for 'See Class Roster' and 'Comments and Suggestions'. A 'Wait List Info' box displays course details: 'Spring 2019 COMS 4170 W sec: 001 USER INTERFACE DESIGN' and 'Instructor: Lydia Chilton'. Below this, a summary row shows 'Class capacity: 100', 'Enrollment: 108', and 'Available: 0'. Further down are 'Show All Details' and 'Refresh List' buttons. At the bottom, a table header for the 'Wait List' is visible with columns for 'Priority', 'Student PID', 'UNI', and 'Student Name'.

**Student Services Online**

► **Wait List**

See Class Roster    Comments and Suggestions

**Wait List Info**

Spring 2019 COMS 4170 W sec: 001 **USER INTERFACE DESIGN**  
Instructor: Lydia Chilton

**Class capacity:** 100    **Enrollment:** 108    **Available:** 0

Show All Details    Refresh List

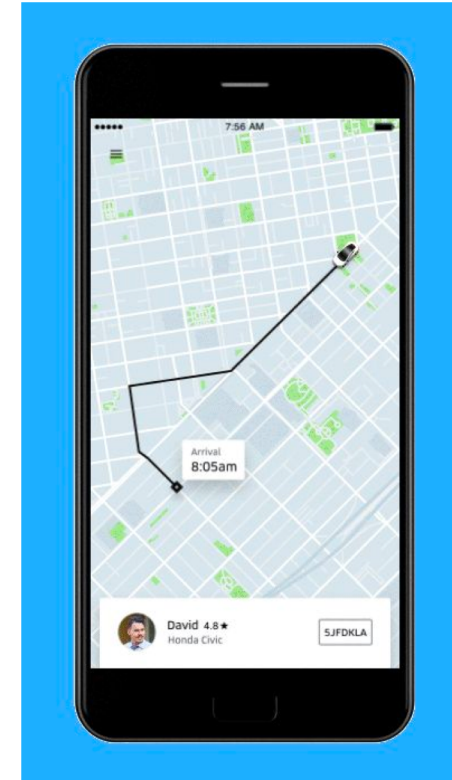
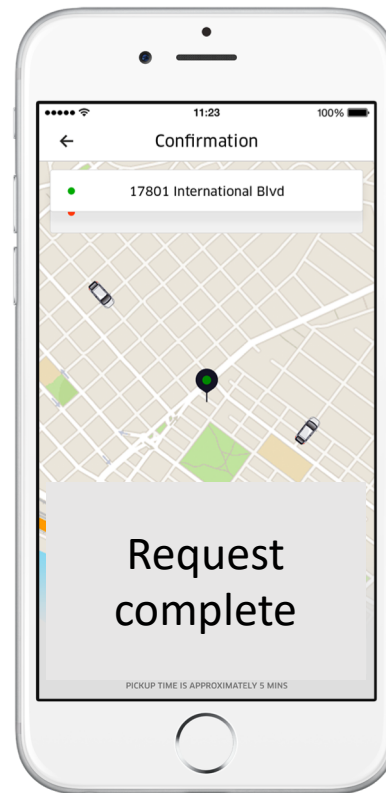
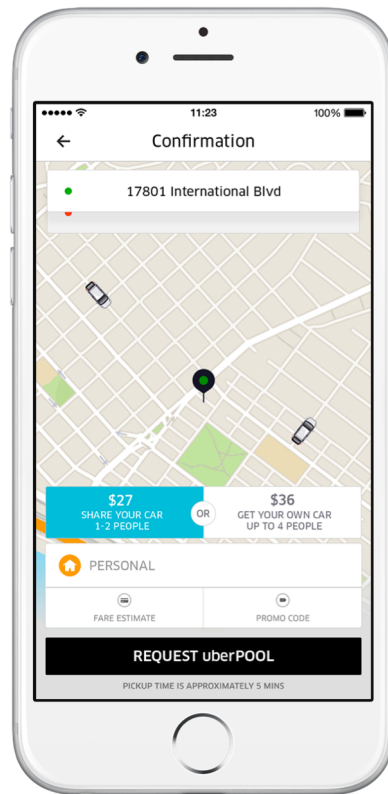
**Wait List**

Priority	Student PID	UNI	Student Name
----------	-------------	-----	--------------

**Feeling:** **Unsure**. Users are **unsure** whether the system is doing it or not.

**Action:** Users have to **ask the system** for feedback frequently.

What goes wrong when feedback acknowledges the action but **does not communicate the new state**?



**Feeling:** **No closure.** Users feel like there's still more to do in the old state.

**Action:** Users will continue to perform actions from the previous state

Design goals for feedback:

Communicate

**full and continuous information** about  
the **results of an action** and  
the **current state of the system**

to help people achieve their goal



Ways of perceiving feedback

How do we perceive this feedback?

**BEEP**



**I'm sorry, Dave.  
I'm afraid I can't do that.**



**Sound**

# Examples of sound feedback?



# How do we perceive this feedback?

**▲ Payment Information**

**Information incorrect**

**Card Number \***

**Expiration Date \***

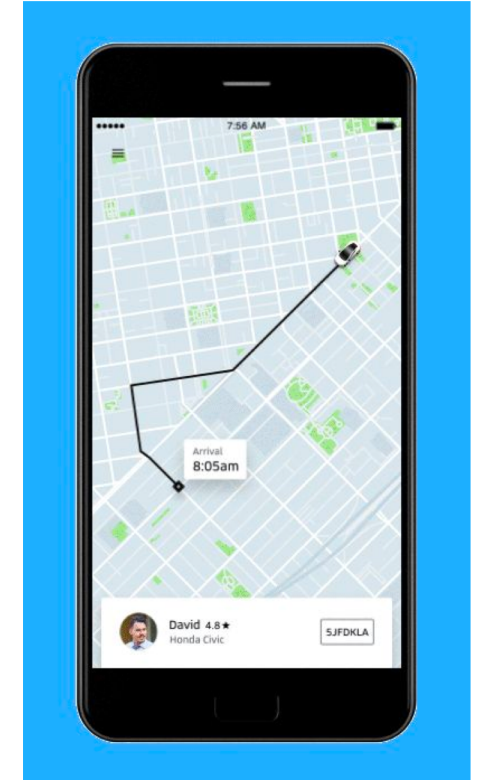
**CCV \***

**PLACE YOUR ORDER**

*Credit card transactions are handled by our secure payment processor. We do not store your credit card information.*

*When you click the 'Place Your Order' button, we'll send you an email message acknowledging receipt of your order. Your contract to purchase an item will not be complete until we send you an email notifying you that the item has been shipped.*

**CONTINUE**



## Sight

# Examples of visual feedback (non-digital)?





How do we perceive this feedback?



**Smell**

# Examples of smell feedback?



How do we perceive this feedback?



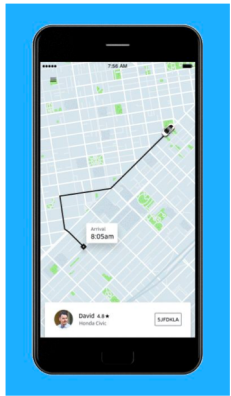
**Touch**

Examples of haptic (touch) feedback?





The human nervous system is designed to perceive feedback in many forms.



Sight



Sound



Smell



Touch



# I just gave a recap of Sesame Street



Sight



Sound



Smell



Touch

Very often, design requires us to go **back to basics**.  
**Basic feelings** like fear and confusion.  
**Basic senses** like sight, sound, and touch.

# Taste



# 3D Printed Food?

 Digital Food: Hod Lipson's Creative Machines Watch later Share



**Pea polenta**

- 310 Kcal
- 15g Fat
- 25.3g Carbs
- 5.8mg Vitamin D

**Beet polenta**

- 425 Kcal
- 20g Fat
- 50.5g Carbs
- 0.56mg Vitamin B3

[MORE VIDEOS](#) 

ROBOTICS • DEVICES • NANOSCIENCE

DIGITAL FOOD

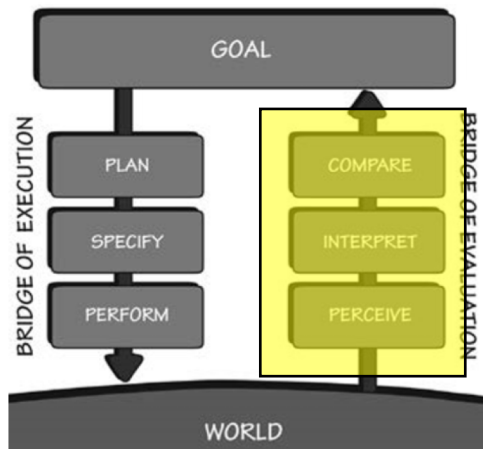
SENSING • IMAGING • VISUALIZATION • MODELING

MATERIALS

# Physical Input Events and Feedback



# Every time the user executes an action, the interface should provide feedback



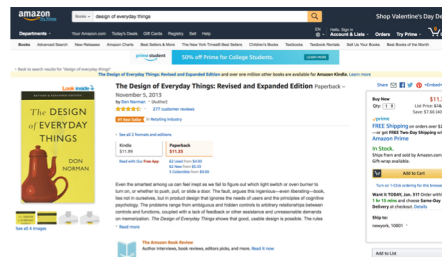
Low-level physical actions, like pressing a key



Low-level virtual actions, like clicking a button

A screenshot of a payment information form. It has a red header 'COMPOSE' and a section titled 'Payment Information'. A red error message says 'The credit card number is invalid.' Below are input fields for 'Card Number \*' (1234123412341234), 'Expiration Date \*' (1220), and 'CCV \*' (999). A blue 'PLACE YOUR ORDER' button is at the bottom.

Mid-level actions, like filling out a form



High-level actions, like buying a book

Low-level user actions are represented in the system as **events**.

## Action

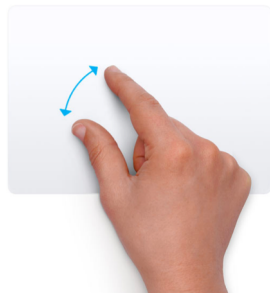


## Event

Keypress event



Mousemove event  
Mousepress event



Pinch gesture event



Low-level physical actions

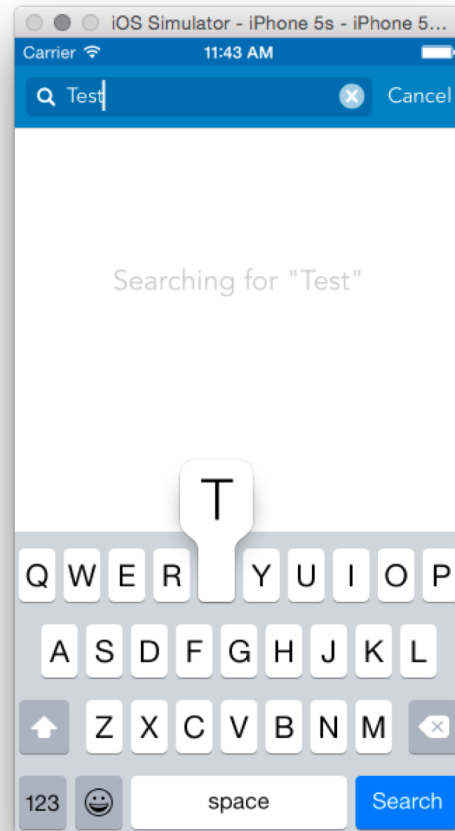
# Types of hard keyboard keypress feedback?



**haptic** (can feel the key), **sound**, and **visual** (screen action)

Low-level physical actions

# Types of soft keyboard **keypress** feedback?



~~haptic (can feel the key)~~, **sound** (simulated), and **visual** (screen action)

Low-level physical actions

# Types of hard keyboard **keydown** feedback?



**haptic** (can feel the spring pushing back),  
**sound** (click), and  
**visual** (character appears or NOTHING (shift key))

Low-level physical actions

# Types of hard keyboard **keyup** feedback?



**haptic** (can feel the spring pushing up),  
**sound** (click), and  
**visual** (characters stop appearing or NOTHING)

Low-level physical actions

# Types of trackpad Mousepress feedback?



**haptic** (spring resistance),  
**sound** (simulated click), and  
**visual** (NOTHING)

Low-level physical actions

# Types of trackpad Mousemove feedback?



**haptic** (can feel the friction),  
~~sound (no), and~~  
**visual** (cursor moves)

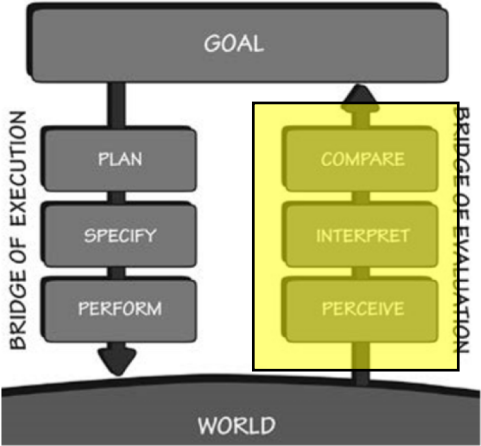


Low-level Virtual Feedback

# Every time the user executes an action, the interface should provide feedback

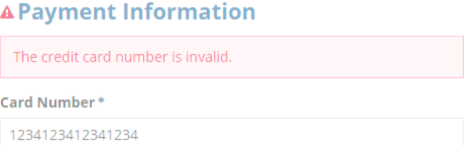


Low-level physical actions, like pressing a key

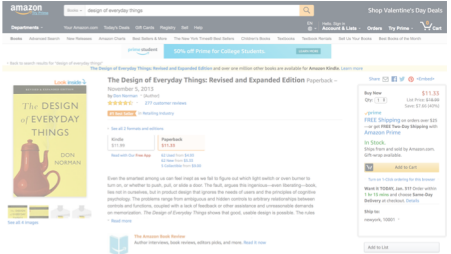


**COMPOSE**

Low-level **virtual actions**, like clicking a button



Mid-level actions, like filling out a form



High-level actions, like buying a book

Subgoal: Press the compose button

# What is the **first event** we respond to?

## Normal state

---



COMPOSE

---

```
.T-I-KE {  
  background-color: ■ #d14836;  
}
```

Subgoal: Press the compose button

# What is the **second** event we respond to?

Normal state



---

```
.T-I-KE {  
  background-color: #d14836;  
}
```

**Mouseover**  
feedback



---

```
.T-I-KE.T-I-JW {  
  background-image: linear-gradient(to  
    bottom, #d14836, #dd4b39);  
}
```

Subgoal: Press the compose button

# What is the **third** event we respond to?

Normal state



```
.T-I-KE {  
  background-color: #d14836;  
}
```

**Mouseover**  
feedback



```
.T-I-KE.T-I-JW {  
  background-image: linear-gradient(to  
    bottom, #d14836, #dd4b39);  
}
```

**Mousedown**  
feedback



```
background-image: linear-gradient(to  
  bottom, #dd4b39, #400000);
```

Subgoal: Press the compose button

# What is the **final** event we respond to?

Normal state



```
.T-I-KE {  
  background-color: #d14836;  
}
```

**Mouseover**  
feedback



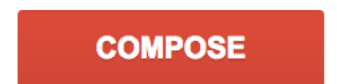
```
.T-I-KE.T-I-JW {  
  background-image: linear-gradient(to  
    bottom, #d14836, #dd4b39);  
}
```

**Mousedown**  
feedback



```
background-image: linear-gradient(to  
  bottom, #dd4b39, #400000);
```

**Mouseup**  
feedback



```
.T-I-KE {  
  background-color: #d14836;  
}
```



# Implementing Low-level Feedback

# How do you implement visual feedback?

## Normal state



```
.T-I-KE {  
  background-color: #d14836;  
}
```

## Mousedown



```
.T-I-KE.T-I-JW {  
  background-image: linear-gradient(to  
    bottom, #dd4b39, #400000);  
}
```

```
1 $(document).ready(function(){  
2   $("#compose_button").mousedown(function(){  
3  
4     //??????????  
5  
6   })  
7 })  
8
```

1. Register an event handler on the object
2. Change the style

# Can you change style like this?

## Normal state



COMPOSE

```
.T-I-KE {  
  background-color: #d14836;  
}
```

## Mousedown



COMPOSE

```
.T-I-KE.T-I-JW {  
  background-image: linear-gradient(to  
    bottom, #dd4b39, #400000);  
}
```

```
1 $(document).ready(function(){  
2   $("#compose_button").mousedown(function(){  
3  
4     $(this).css("background-image", "linear-gradient(to bottom, #dd4b38, #400000)")  
5  
6   })  
7 })  
8
```

Yes. It will work, but it's **ugly**.

# This is the better way to change style. Why?

## Normal state



COMPOSE

```
.T-I-KE {  
  background-color: #d14836;  
}
```

## Mousedown



COMPOSE

```
.T-I-KE.T-I-JW {  
  background-image: linear-gradient(to  
    bottom, #dd4b39, #400000);  
}
```

```
1 $(document).ready(function(){  
2   $("#compose_button").mousedown(function(){  
3  
4     //$(this).css("background-image", "linear-gradient(to bottom, #dd4b38, #400000)")  
5     $(this).addClass("T-I-JW")  
6  
7   })  
8 })
```

Classes abstract out designs to make them easier to add / remove.

Feedback:

Communicate

full and continuous information about  
the results of an action and  
the **current state of the system**

to help people achieve their goal

# Mid-and High-level Action Feedback

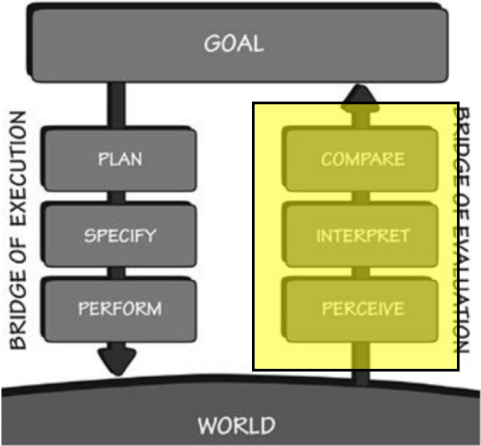
# Every time the user executes an action, the interface should provide feedback



Low-level physical actions, like pressing a key



Low-level virtual actions, like clicking a button



Mid-level actions, like filling out a form

High-level actions, like buying a book



# If you mess up your credit card info, what feedback do you get?

---

**▲ Payment Information**

The credit card number is invalid.

**Card Number \***

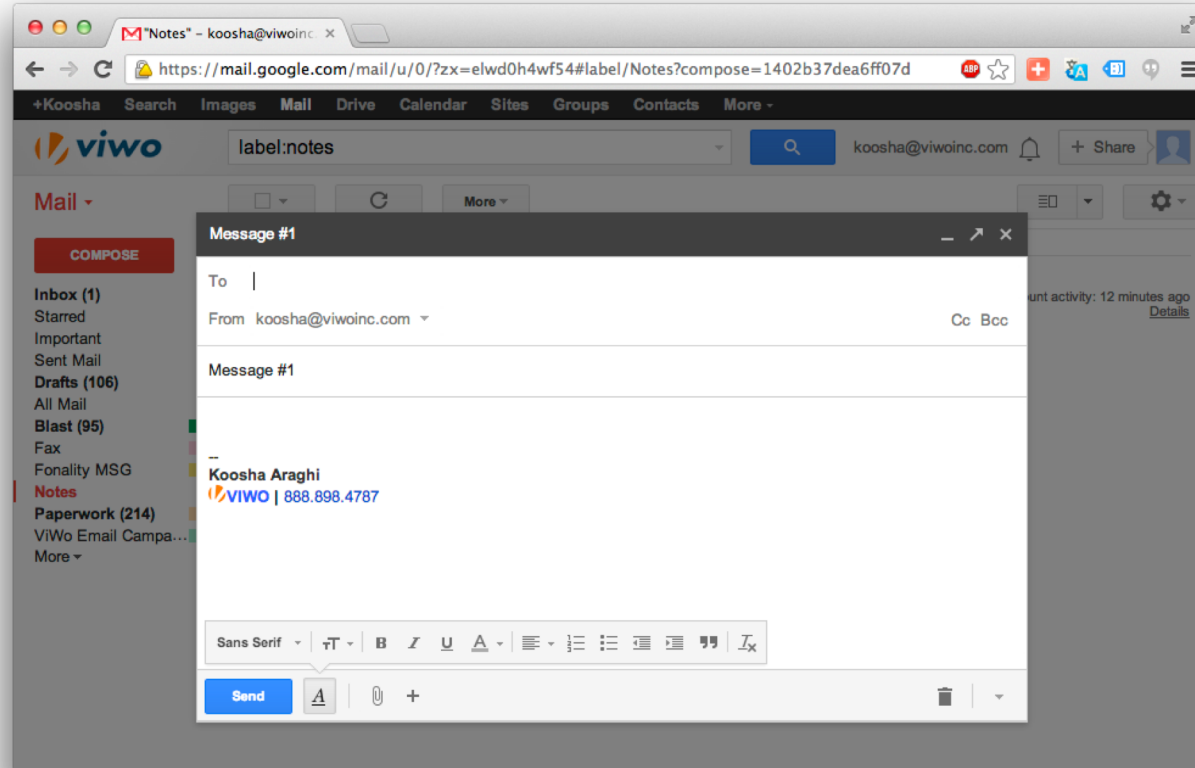
**Expiration Date \***

**CCV \***

**PLACE YOUR ORDER**

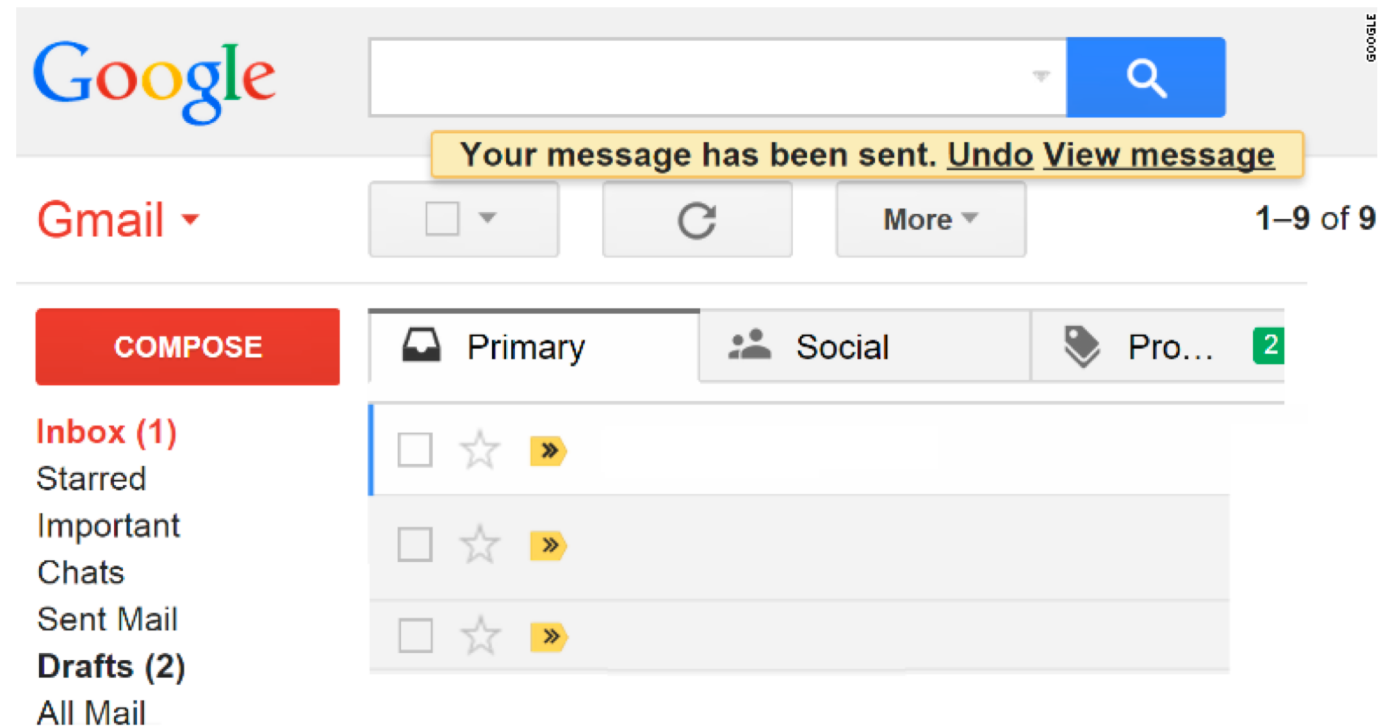
## Red messages

After you press  , what feedback do you get?



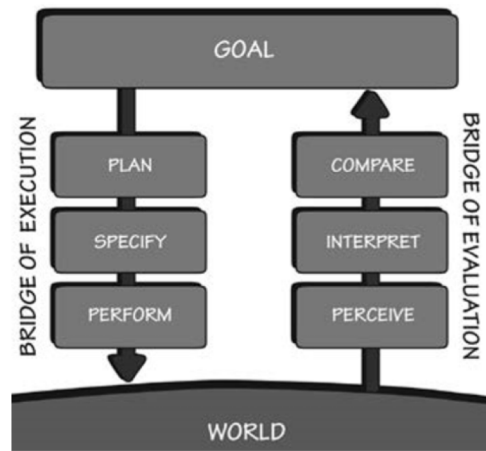
You enter the compose email state

After you send your message, what feedback do you get?



Go back to normal inbox state

# Every time the user executes an action, the interface should provide feedback



Low-level physical actions, like pressing a key



Low-level virtual actions, like clicking a button

A screenshot of a payment information form. It has a red header 'COMPOSE' and a section titled 'Payment Information'. A red error message says 'The credit card number is invalid.' Below are input fields for 'Card Number \*' (1234123412341234), 'Expiration Date \*' (1220), and 'CCV \*' (999). A blue 'PLACE YOUR ORDER' button is at the bottom.

Mid-level actions, like filling out a form



High-level actions, like buying a book

# Feedback is fundamental to life. We can't just follow rules.



## Pancake Recipe

**Ingredients**  
100g plain flour  
300ml milk  
2 eggs  
1tbsp caster sugar  
Lemon juice



**Equipment**  
Sifter  
Large mixing bowl  
Kitchen scales  
Measuring jug  
Measuring spoons  
Wooden spoon  
Frypan  
Spatula  
Stove

**Method**

1. Sift the flour into the mixing bowl.
2. Crack the eggs into the bowl.
3. Pour the milk into the bowl.
4. Stir vigorously until smooth.
5. Pour a spoonful of the mixture into a hot frypan (you may want to use oil).
6. Turn the pancake when the bubbles begin to pop.
7. Serve sprinkled with lemon juice and sugar.

© 2014 Food Network

# Following instructions suck. Why?

how to setup windows  

**All** Videos Images Shopping News More Settings Tools

About 22,600,000 results (0.59 seconds)

### Clean Install

1. Enter your computer's BIOS. ...
2. Find your BIOS's boot device menu. ...
3. Select the CD-ROM drive as the first boot device of your computer. ...
4. Save the changes on the BIOS. ...
5. Shut off your computer. ...
6. Power on the PC and the insert the Windows 7 disc into your CD/DVD drive.
7. Start your computer from the disc.

More items...

**How to Install Windows 7 (Beginners) (with Pictures) - wikiHow**  
[https://www.wikihow.com/Install-Windows-7-\(Beginners\)](https://www.wikihow.com/Install-Windows-7-(Beginners))

1. People make mistakes.  
2. Unexpected things happen.  
They need feedback to learn and adjust.



# Iterative Programming is about creating feedback

What is the **smallest** unit of progress I can make?

## Iteration

```
<html>
  <body>
    Hello world!
  </body>
</html>
```

Hello World!

## Goal



Does it look ok?

# Feedback is essential to achieving goals

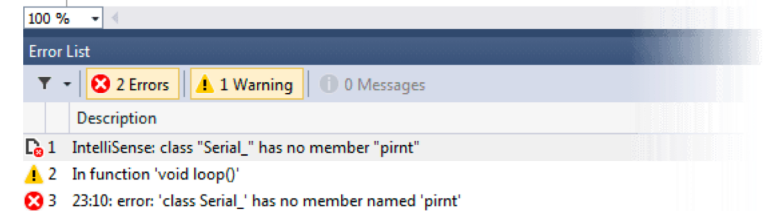


Learning to walk



Playing an instrument

```
void loop() {  
  float humidity = 452;  
  for( int counter = 0; counter < 1000; ++counter ) {  
    digitalWrite(13, HIGH); // set the LED on  
    delay( 200 ); // wait for a second  
    digitalWrite(13, LOW); // set the LED off  
    Serial.pirnt( "Hello " );  
    Serial.println( counter );  
    delay(200); // wait for a second  
    humidity += 0.5;  
  }  
}
```



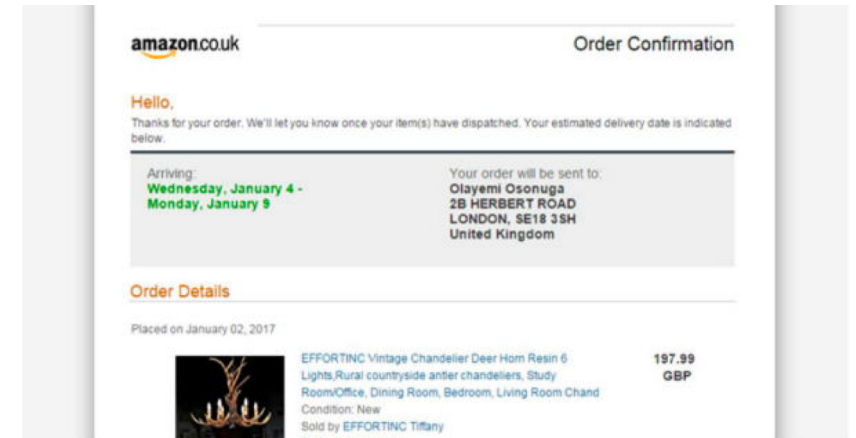
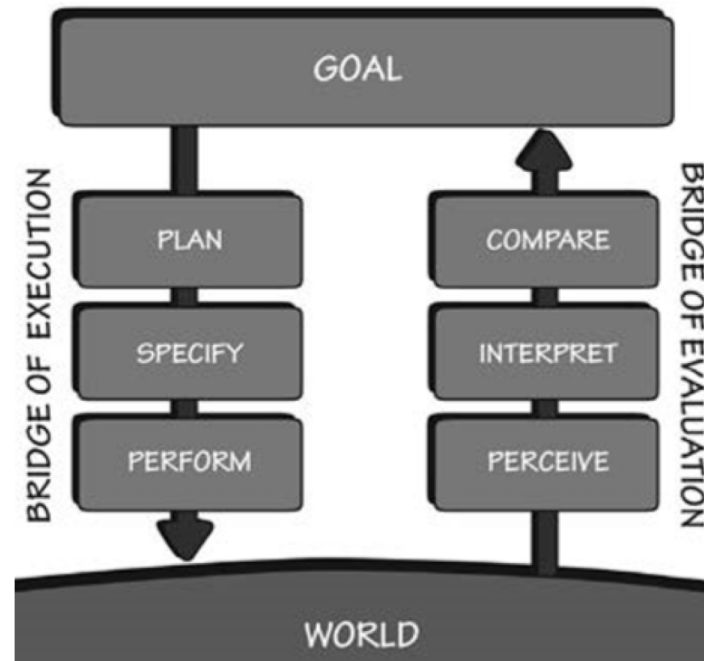
Code

Feedback is how we learn

# Homework Review

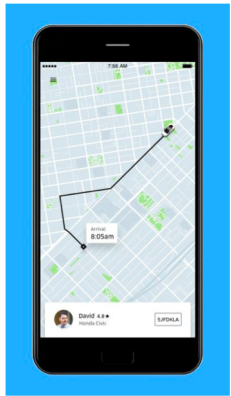
# Summary

To accomplish a goal, users must **execute** an operation and **evaluate** the result



To help users **evaluate the result**, designers must provide **feedback**.

The human nervous system is designed to perceive feedback in many forms.



Sight



Sound



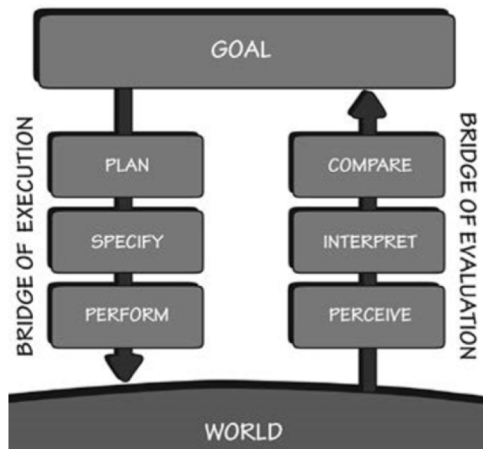
Smell



Touch



# Every time the user executes an action, the interface should provide feedback



Low-level physical actions, like pressing a key



Low-level virtual actions, like clicking a button

A screenshot of a payment information form. It has a red header 'COMPOSE' and a red error message: 'The credit card number is invalid.' Below the error are input fields for 'Card Number \*', 'Expiration Date \*', and 'CCV \*'. A blue 'PLACE YOUR ORDER' button is at the bottom.

Mid-level actions, like filling out a form



High-level actions, like buying a book

# Adding/Removing CSS Classes are a modular way to implement visual feedback.



```
1 $(document).ready(function(){
2     $("#compose_button").mousedown(function(){
3
4         //$(this).css("background-image", "linear-gradient(to bottom, #dd4b38, #400000)")
5         $(this).addClass("compose_press_state")
6
7     })
8 })
```

Normal state



Mouseover



Mousedown



Normal state



# Feedback is essential to achieving goals

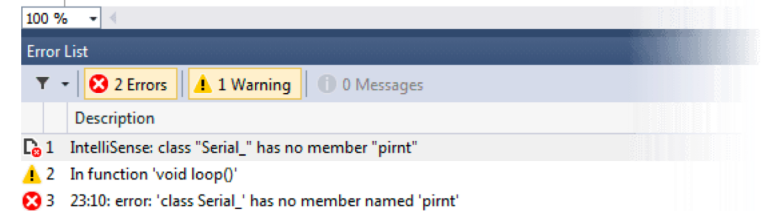


Learning to walk



Playing an instrument

```
void loop() {  
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  for( int counter = 0; counter < 1000; ++counter ) {  
    digitalWrite(13, HIGH); // set the LED on  
    delay( 200 ); // wait for a second  
    digitalWrite(13, LOW); // set the LED off  
    Serial.pirnt( "Hello " );  
    Serial.println( counter );  
    delay(200); // wait for a second  
    humidity += 0.5;  
  }  
}
```



Code

Feedback is how we learn