交互设计、键盘鼠标交互&交互界面设计

INTERACTION DESIGN, MOUSE & KEYBOARD INTERACTION & THE GRAPHICAL USER INTERFACE

Week_03_2

INTERACTION DESIGN

INTERACTION｜交互

Interaction is a reciprocal action that occurs as multiple objects and / or lifeforms have an ongoing effect on one another.

交互是一种发生在多个个体间的一种相互行为，对双方都会产生影响

DESIGN｜设计

Design is the process of conceiving, planning, and producing something. Designers produce documents like **sketches and schematics**, as well as working **prototypes** in an attempt to model and **simulate** design ideas.

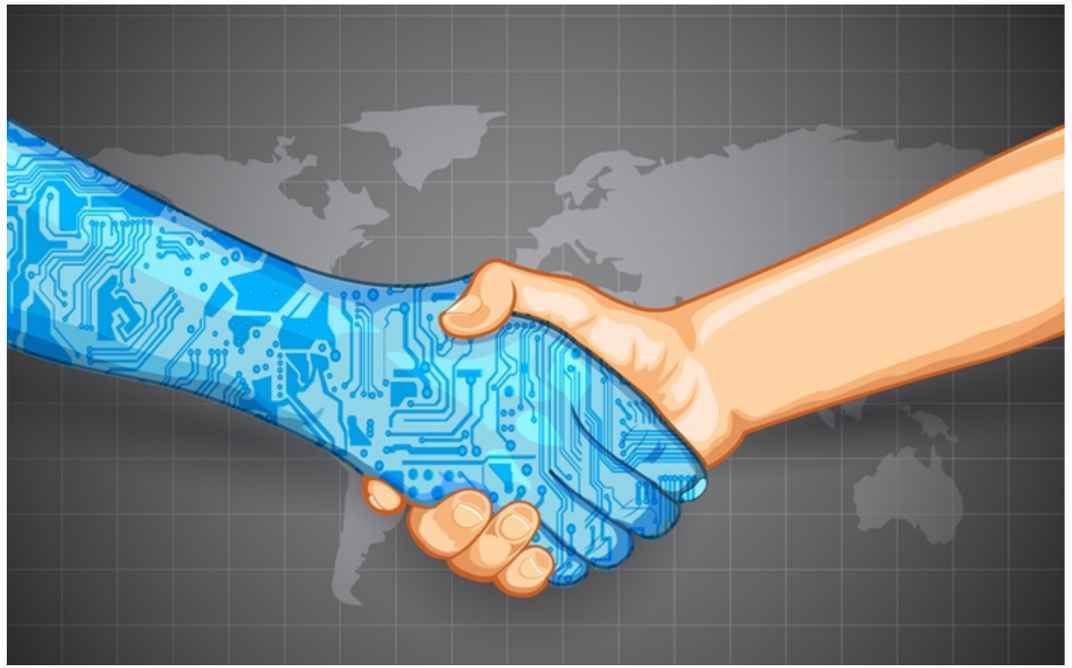
设计是创造性地理解并解决问题

INTERACTION DESIGN｜交互设计

Interaction Design is a design discipline that involves the human-centered design of objects, environments, and systems.

交互设计，又称**互动设计**，是定义、设计人造系统的行为的设计领域

比尔・摩格理吉在20世纪80年代后期提出了交互设计的概念。初始名为"SoftFace"，后改名为交互设计



BILL MOGGRIDGE

Bill Moggridge was an English designer, author, and educator who cofounded the design company IDEO and coined the term Interaction Design with designer and researcher Bill Verplank.

比尔·摩格理吉，1943－2012，是一位英国知名产品设计师，工业设计教授，交互设计书籍作者，同时也是工业设计顾问公司IDEO的创办人。他以采纳人性工程的工业设计理论著名，同时也是现今产品设计主流理论的开发者

THE INTERFACE｜交互界面

Interaction design is concerned with people and their relationship to things, whether they are tools or toys, mechanical or electronic devices, hardware or software based, or virtual or physical spaces. Relationships happen in the space in-between, the interface. The interface is the point of connection between people and things.

交互设计是考量人以及物与人之间关系的设计，关系发生在人与物之间的空间中，而交互界面就是人与无之间的联系的关键。

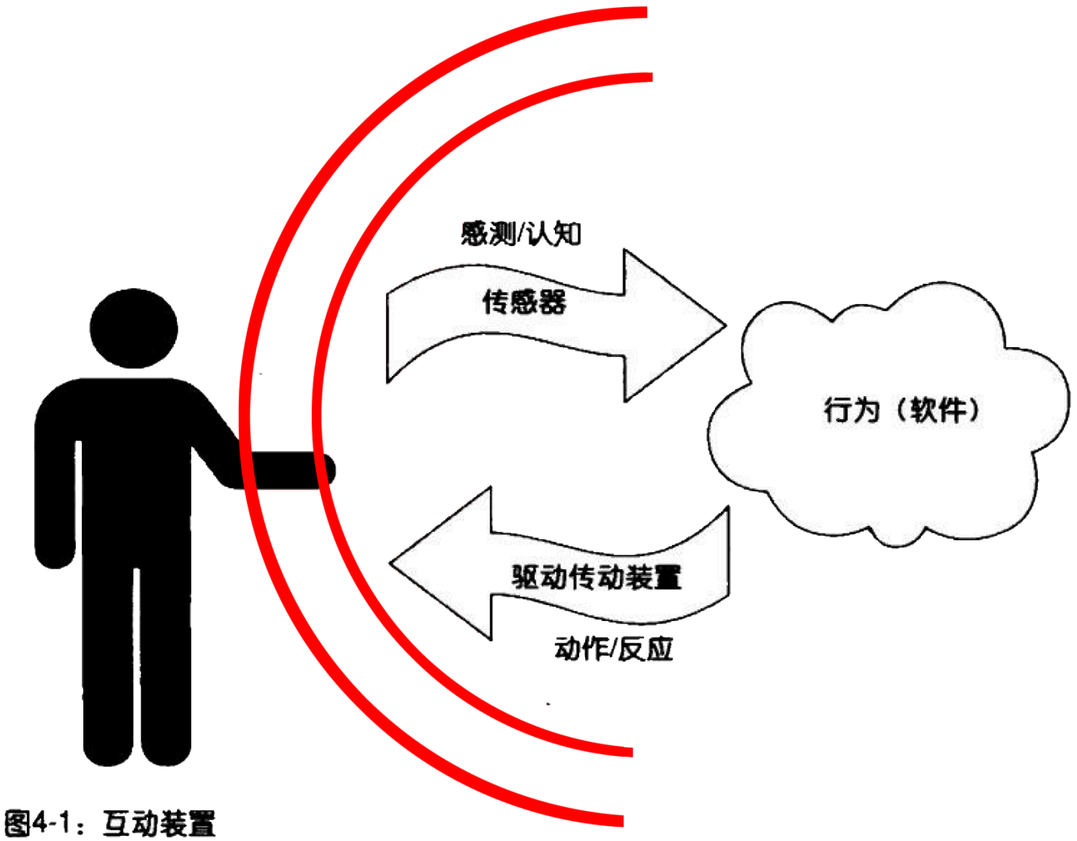
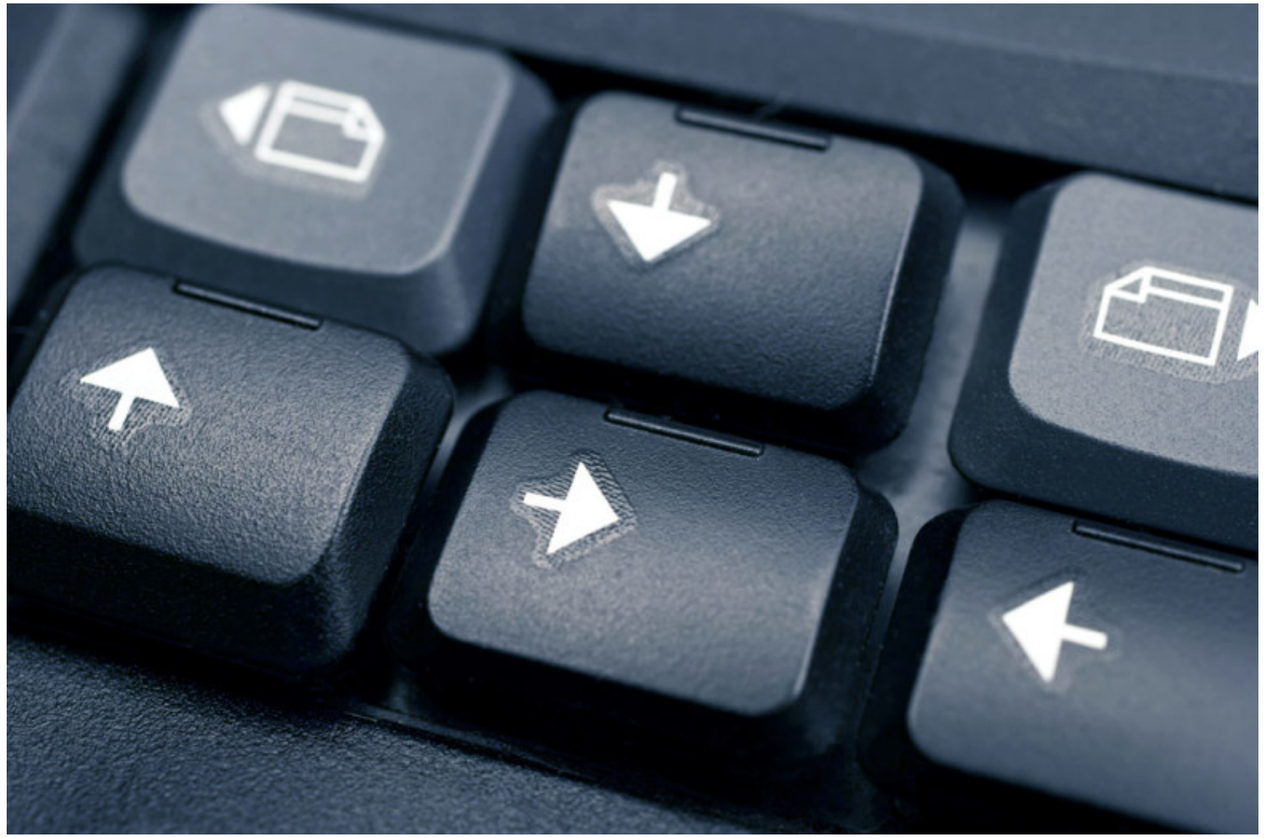


图4-1：互动装置

IMPORTANCE OF INTERACTION DESIGN
交互设计的重要性

Interaction design is important because great interfaces make using things, navigating spaces, and depending on systems a more enjoyable, less frustrating experience.

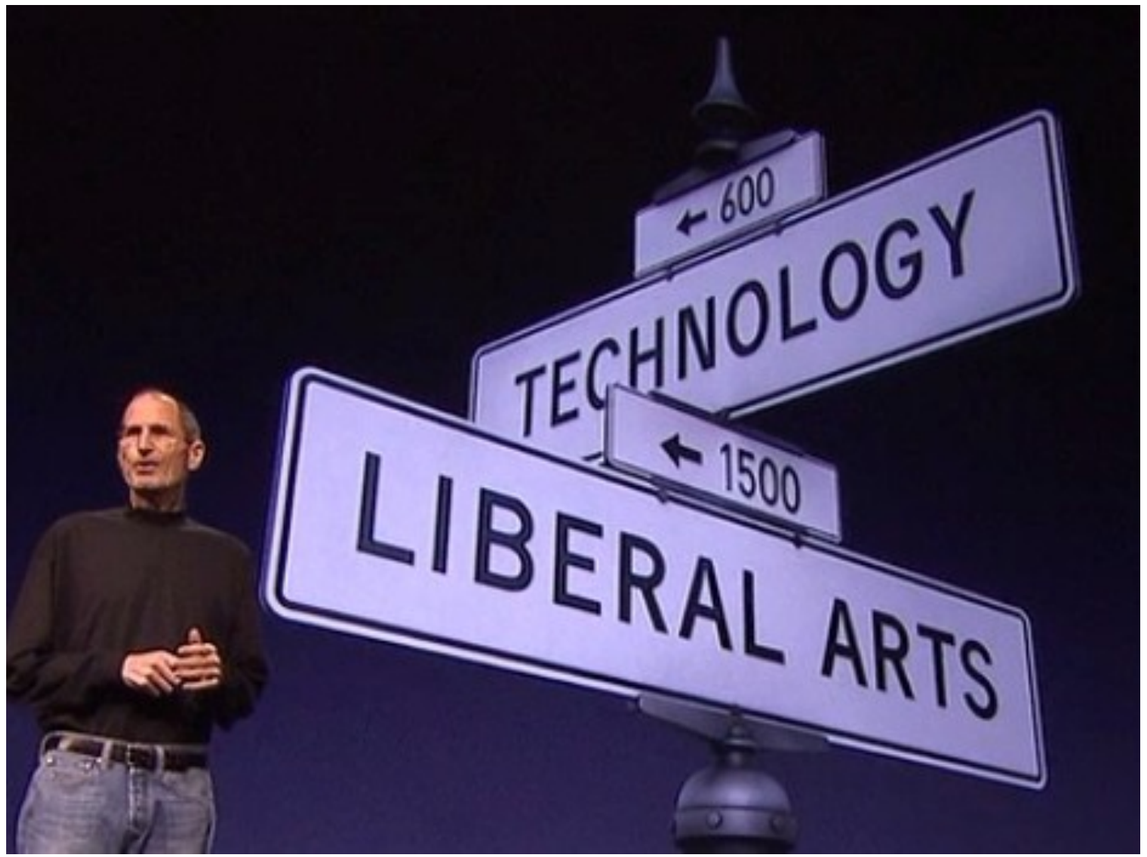
为什么交互设计重要？
优秀的交互界面能提供使用帮助，有清晰的导向设计，依靠系统的帮助能获得愉悦使用体验而减少麻烦



MULTIPLE DISCIPLINES｜跨学科属性

Interaction Design is a discipline that draws on many diverse subjects, such as design, engineering and psychology. As a discipline, it is concerned with the form, function, behavior and experience of the tools we use and the spaces we inhabit.

交互设计是一个跨学科的集成，它囊括设计、工程以及心理学，其考量的对象包括但不限于日常使用的工具和生活空间的形式、功能、行为以及认知经验等方方面面

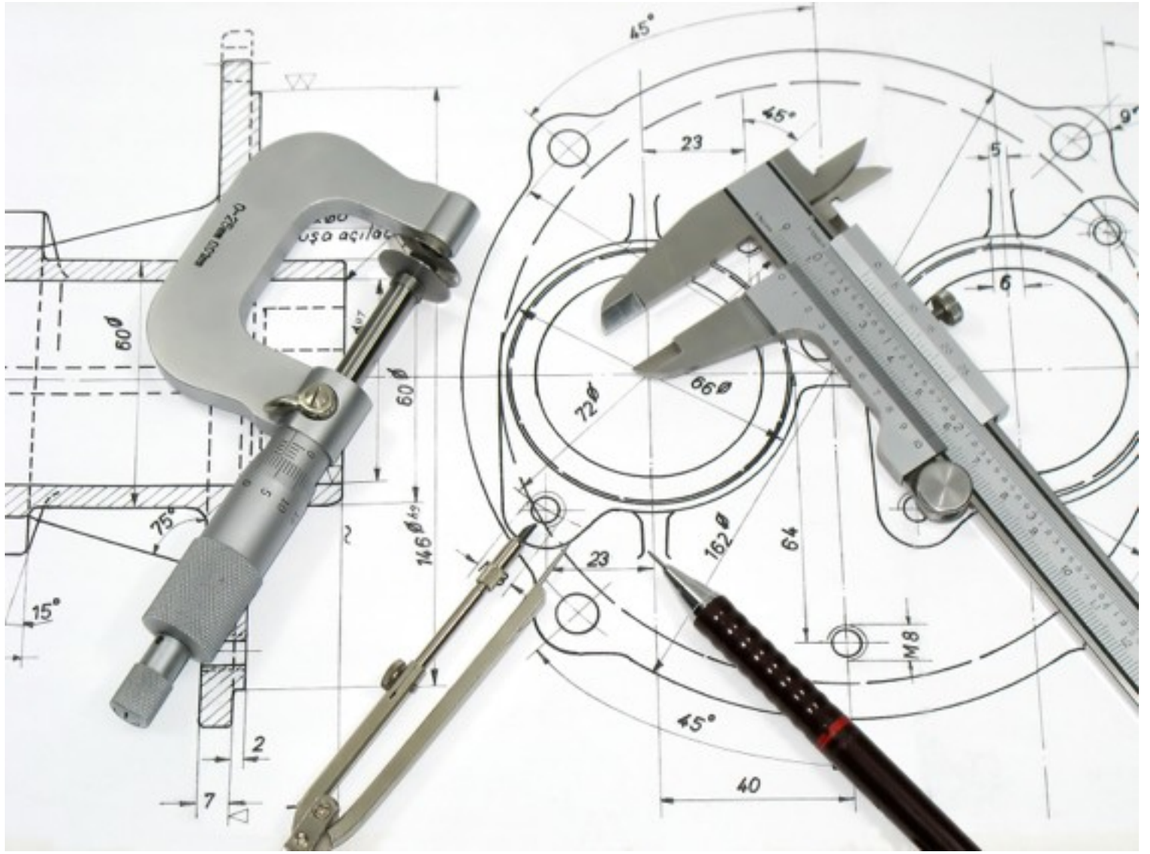


PRODUCT DESIGN｜产品设计

Product design is the development of new products, usually by companies for consumers.

Product design encompasses industrial design and interface design.

开发新的产品（产品设计）包括工业设计和交互设计



INDUSTRIAL & INTERFACE DESIGN
工业设计&交互设计

Industrial design involves the development and production of physical goods.
Interface design involves the development of systems that allow for communication with and control of physical and digital goods and services.

工业设计设计涉及物理产品的开发和制造，而交互设计包含电子、物理部件的通讯和控制系统开发。

ENVIRONMENTAL DESIGN｜环境设计

Environmental design involves the design of spaces such that they address human need and use.

Environmental Design requires understanding of architecture and information architecture.

环境设计涉及空间设计，指向人的使用需求，其需要对建筑以及信息框架的理解

INFORMATION ARCHITECTURE

Architecture involves the planning, design and construction of enclosed and unenclosed environments.

Information architecture is the arrangement of information so that it can best address the needs of those who use it.

EXPERIENCE DESIGN

Experience design places a high value on the cognitive and psychological well-being of the people who will engage in the use of a product or occupation of a space.
Experience design is concerned with both usability and accessibility.

USABILITY, ACCESSIBILITY & ERGONOMICS

Usability is a measure of the ease with which people can use something. Accessibility refers to the breadth of availability of an object or space to a population of users. Ergonomics is the design of things with concern for the human body and mind.

INTERACTION DESIGN PRINCIPLES

The field of interaction design relies on numerous principles, some of the most important ones are:

- Intentionality& Consistency
- Predictability& Learnability
- Timely& Relevant
- Feedback Perceived Affordance

INTENTIONALITY & CONSISTENCY

Design choices should be intentional, or always done with purpose, rather than arbitrary.
Design choices should also be consistent, meaning without visual or logicalContradiction.
Designers use symbols, form, color, size, position, and other visual characteristics to convey intent.

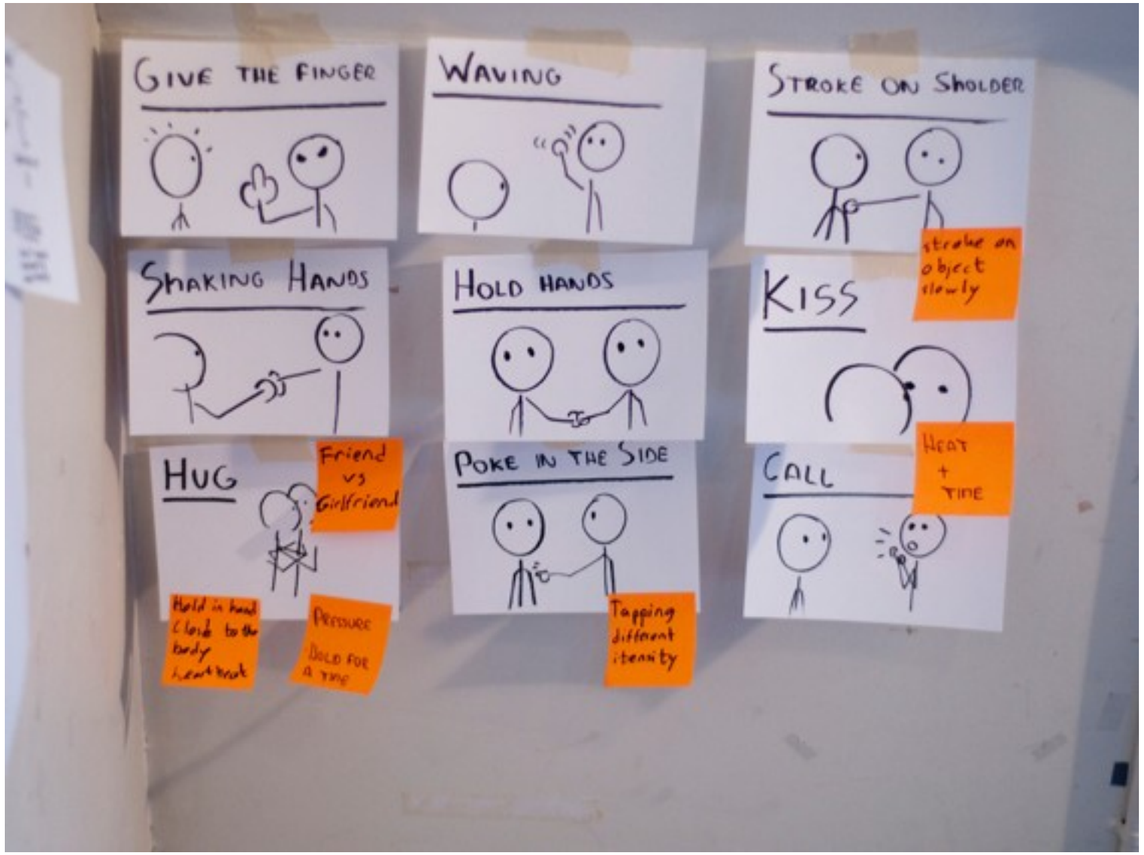
PHOTO BY JIMABELES

PREDICTABILITY & LEARNABILITY

Predictability in design is not boring, it is essential for understanding.
Predictability allows users to rely on prior knowledge so that they can transfer that knowledge when learning something new.
It also allows users to make assumptions about what will happen next.

TIMELY & RELEVANT FEEDBACK

Feedback refers to a design's capacity to provide useful information in response to user actions.
Feedback can convey status or progress, make users aware of future possibilities, or provide closure at the end of an action.
Feedback should be informative, but generally not interruptive.



PERCEIVED AFFORDANCE

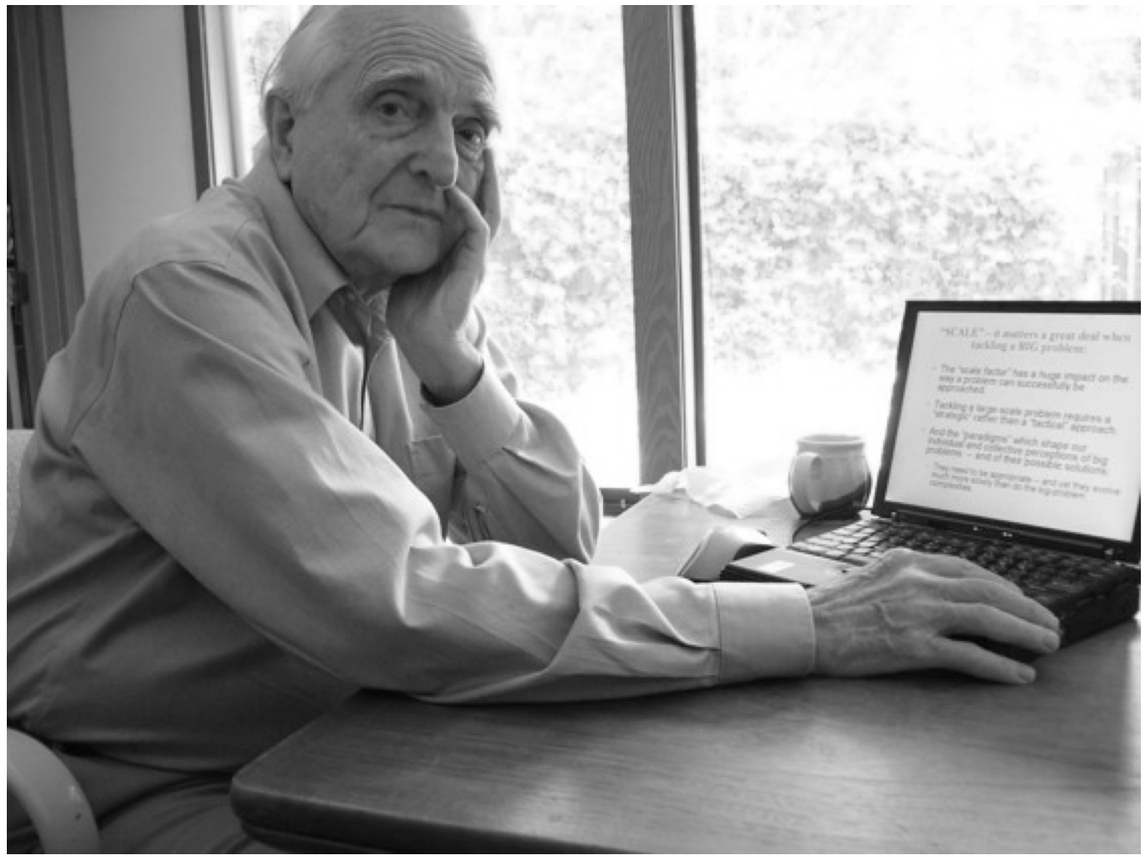
Affordance is a term used to describe the opportunity for action that an object has by the nature of it’s design. Perceived affordance characterizes the suggested opportunity for action that a design conveys to users.

ORIGINAL APPLE MOUSE

Apple Computer approached IDEO about designing a mouse for their Lisa computer, a precursor of today's Macs, in 1980.
Although this mouse would become the first commercially available mouse, it was based on concepts explored by Douglas Englebart in the 1960s and by researchers at the Xerox's Palo Alto Research Center (PARC) in the 1970s.

DOUGLAS ENGLEBART

Douglas Englebart was an American engineer who’s inventions included the computer mouse, the graphical user interface, and hypertext.



PROTOTYPE COMPUTER MOUSE

Englebart’s prototype computer mouse was an early computer input device. It was called a mouse because the device’s attached cable made it resemble a field Mouse. Although Englebart’s team experimented with other types of input devices, the mouse won out over other designs because it was fast to learn and use.

KEYBOARD & MOUSE INTERACTION

KEYBOARD & MOUSE INTERACTION

The keyboard and mouse are among the most common types of input devices for a computer. Processing has several environment variables and built-in functions that relate to the mouse and keyboard. These variables and functions make it possible to track the mouse and keyboard usage of the user.

PHOTO BY FOTOS NIKON D40/D50

KEYPRESSED() FUNCTION

The keyPressed() function is a built-in function that is automatically called once each time a keyboard key is pressed.

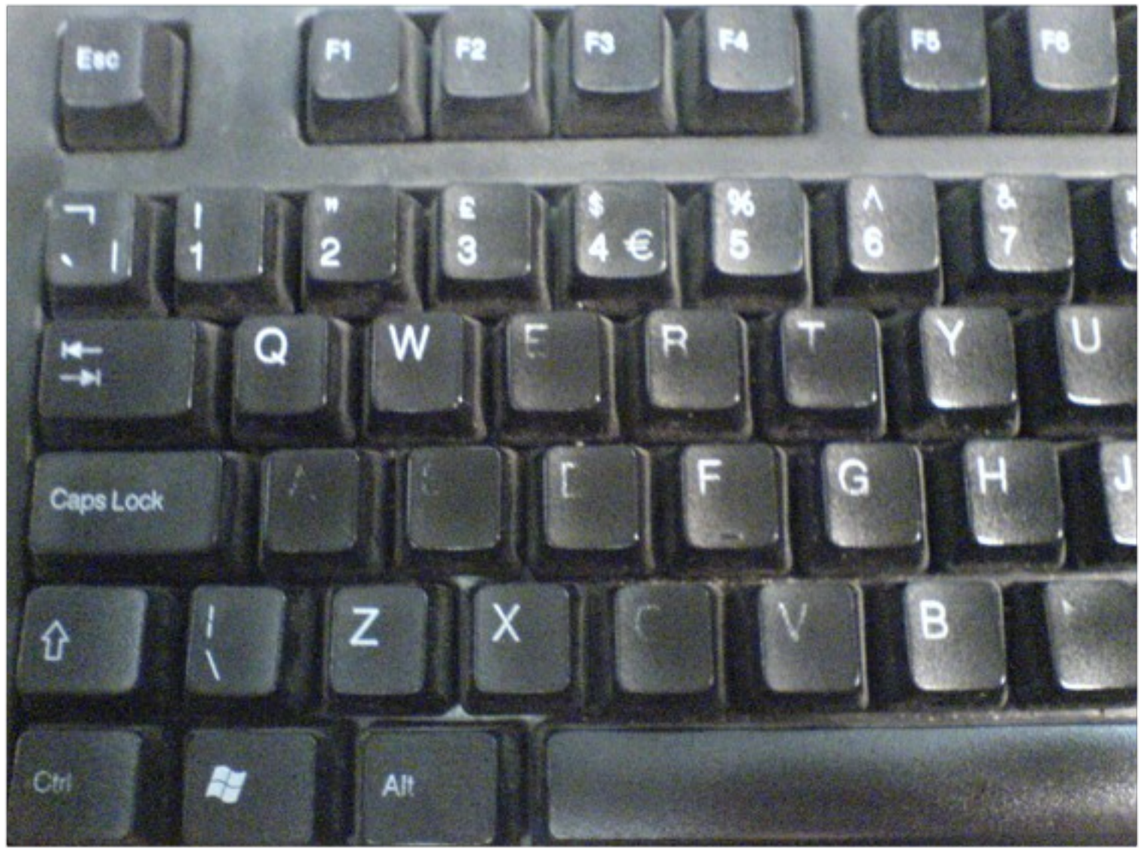


PHOTO BY TOMNATT

KEYPRESSED VARIABLE

The keyPressed variable is an environment variable that stores the current state of the keyboard as a boolean value, true if any key is pressed and false if no key is pressed.
When keyPressed is used inside a conditional within the draw() function you can repeatedly test the current state of the keyboard.

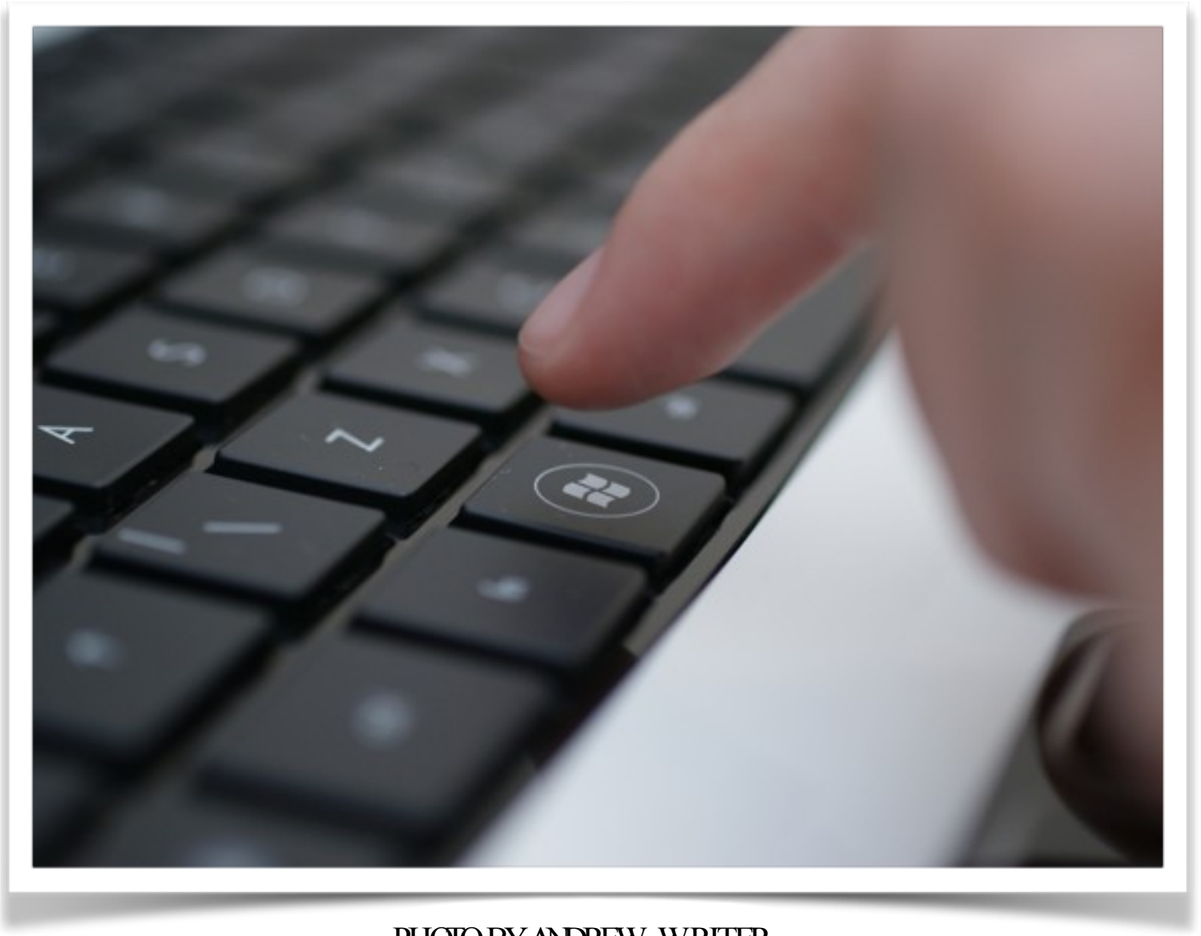


PHOTO BY ANDREW_WRITER

KEYRELEASED() & KEYTYPED() FUNCTIONS

keyReleased() is called once after a keyboard key has been released.

keyTyped() is called once after a keyboard key has been pressed and released.

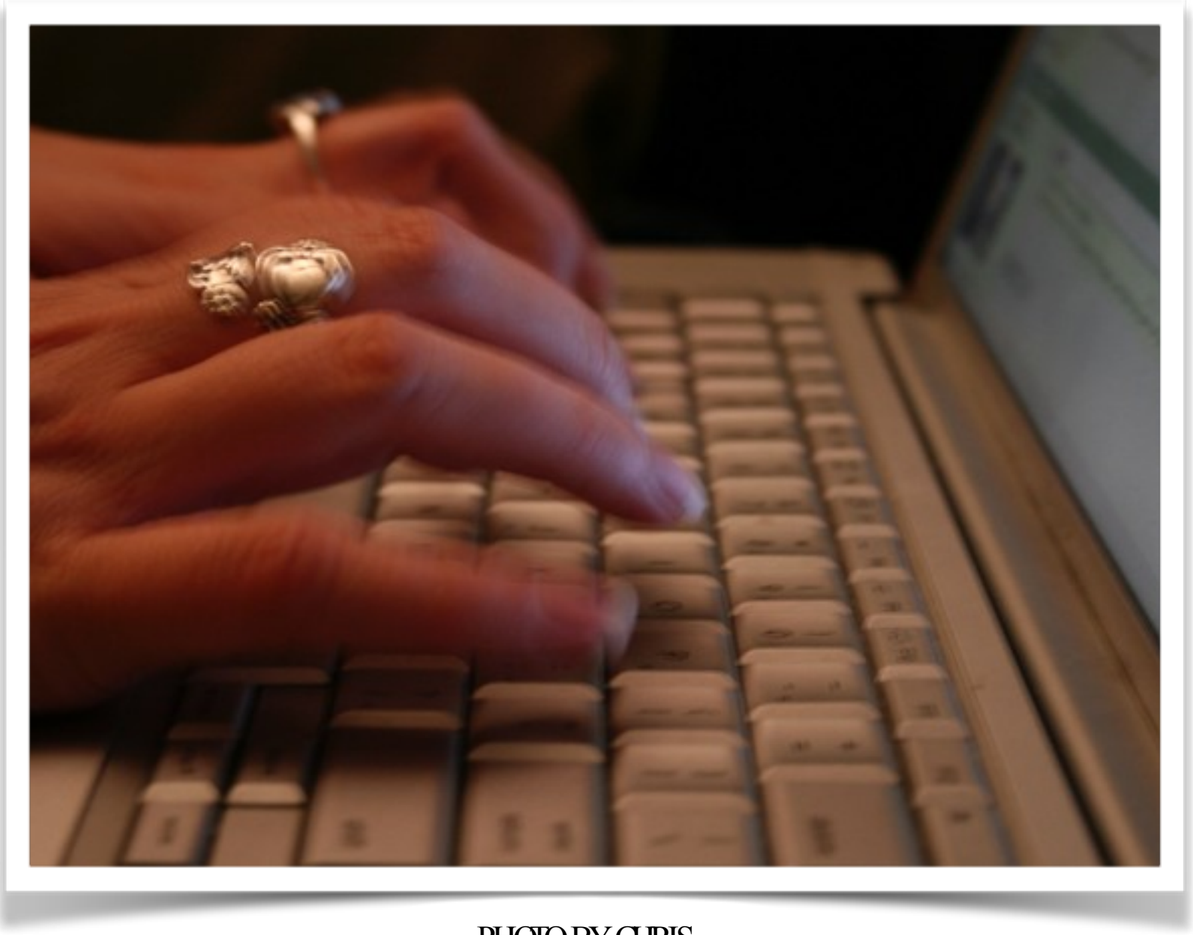


PHOTO BY CHRIS

KEY VARIABLE

The key environment variable stores the value of the most recently pressed keyboard key as a char value.

PHOTO BY JACK KEENE

CHAR DATATYPE

The char datatype holds character values, or single typographic symbols such as letters, numbers, and punctuation.
Chars values in Processing are contained within single quotes.

PHOTO BY BETTINCHE

KEY VARIABLE EXAMPLE

```
if (key == 'a' || key == 'A') {
   fill(0);
}
```

KEYCODE VARIABLE

The keyCode environment variable must be used to detect special keys such as UP, DOWN, LEFT, RIGHT, ALT, CONTROL, and SHIFT.

Before you can use keyCode, you must first test if the key is coded.

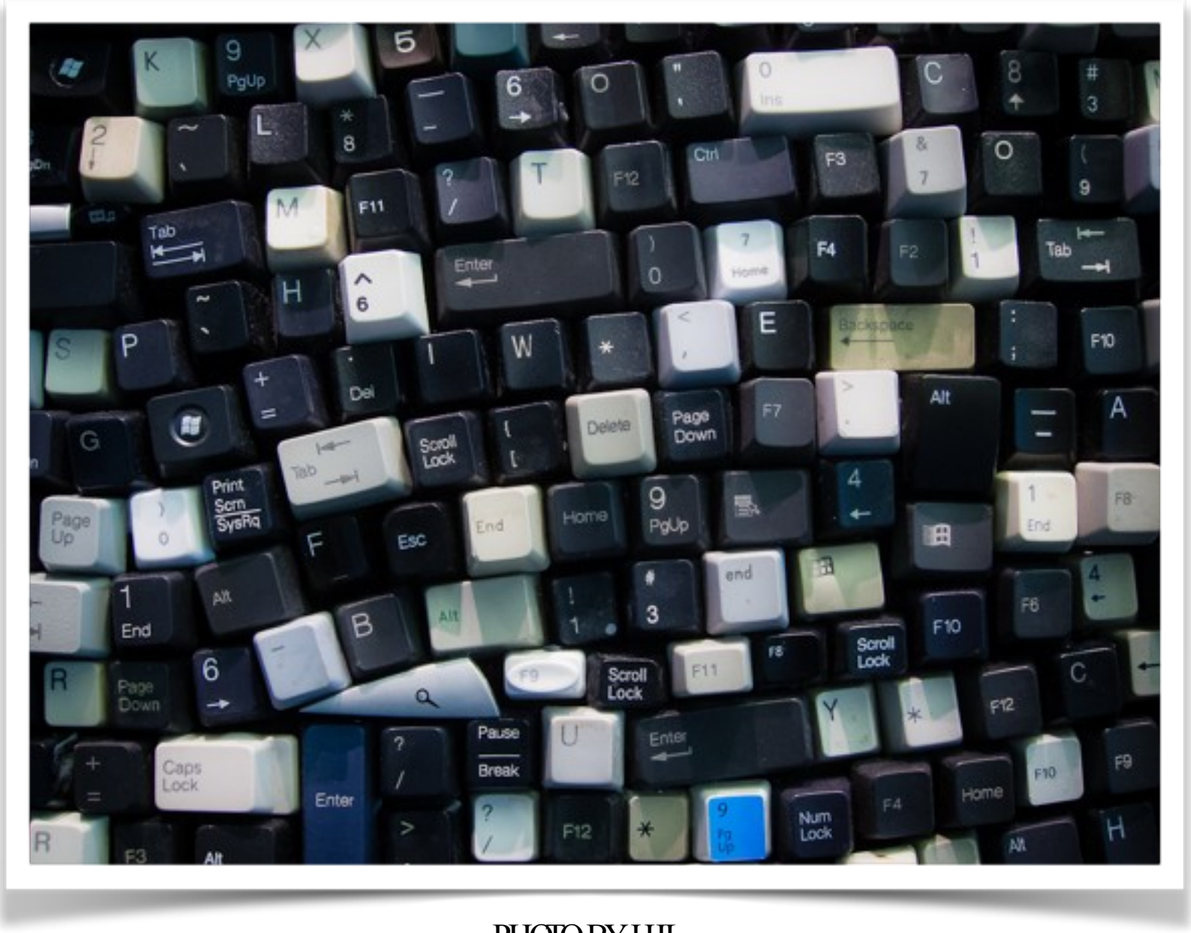


PHOTO BY HJL

KEYCODE VARIABLE EXAMPLE

```
if (key == CODED) {
   if (keyCode == UP) {
      fillVal = 255;
   } else if (keyCode == DOWN) {
      fillVal = 0;
   }
} else
   { fillVal 126;
} =
```

MOUSEPRESSED() FUNCTION

The mousePressed() function is a built-in function that is automatically called once each time the mouse button is pressed.

PHOTO BY RANECO

MOUSEPRESSED() FUNCTION EXAMPLE

```
void mousePressed()
  { if (value == 0) {
    value = 255;
  } else
    { value =
  } 0;
}
```

MOUSEPRESSED VARIABLE

The mousePressed variable is an environment variable that stores the current state of the mouse button as a boolean value, true for pressed and false for not pressed.
When mousePressed is used inside a conditional within the draw() function you can repeatedly test the current state of the mouse button.

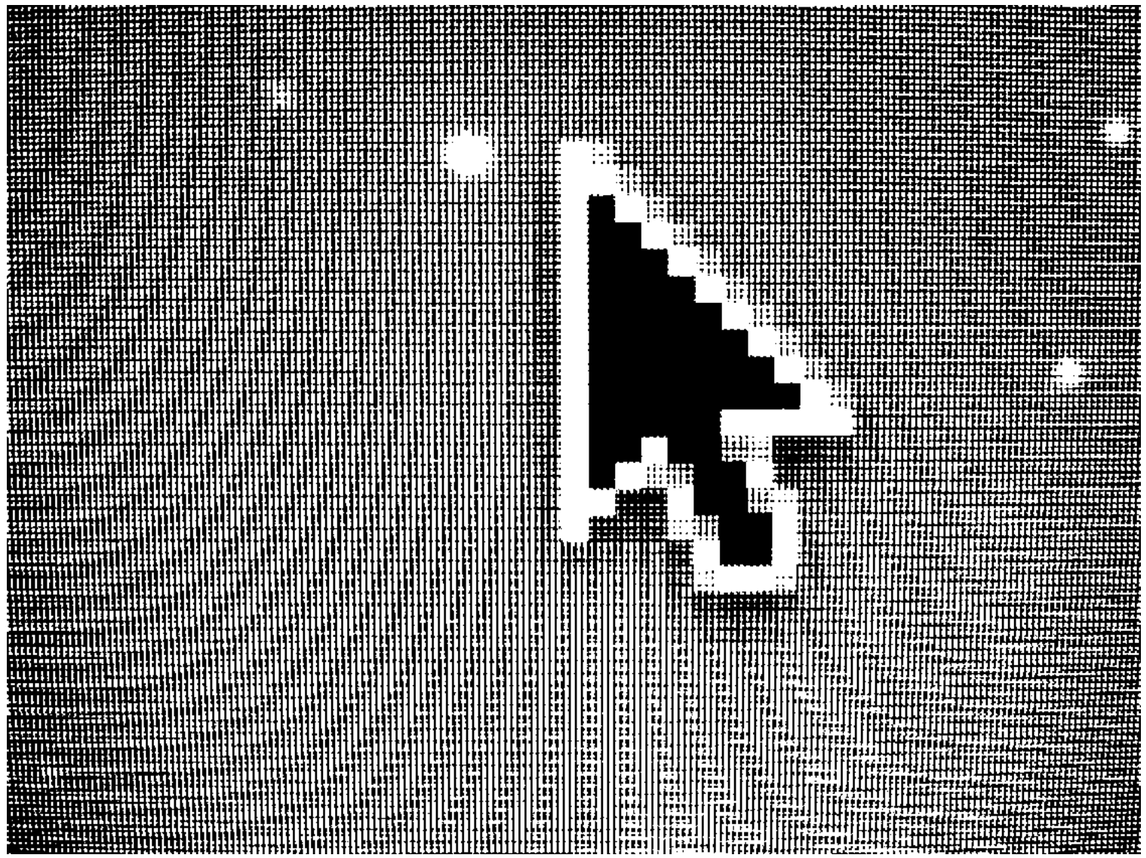
PHOTO BY TATIANA BULYONKOVA

MOUSEPRESSED VARIABLE EXAMPLE

```
void draw() {
  if (mousePressed == true) {
    fill(0);
  } else {
    fill(255);
  }
  rect(25, 25, 50, 50);
}
```

MOUSEX, MOUSEY, PMOUSEX & PMOUSEY

mouseX and mouseY are environment variables that store the coordinates of the mouse position from the current frame. pmouseX and pmouseY are environment variables that store the coordinates of the mouse position from the previous frame.



MOUSEX, MOUSEY, PMOUSEX & PMOUSEY EXAMPLE

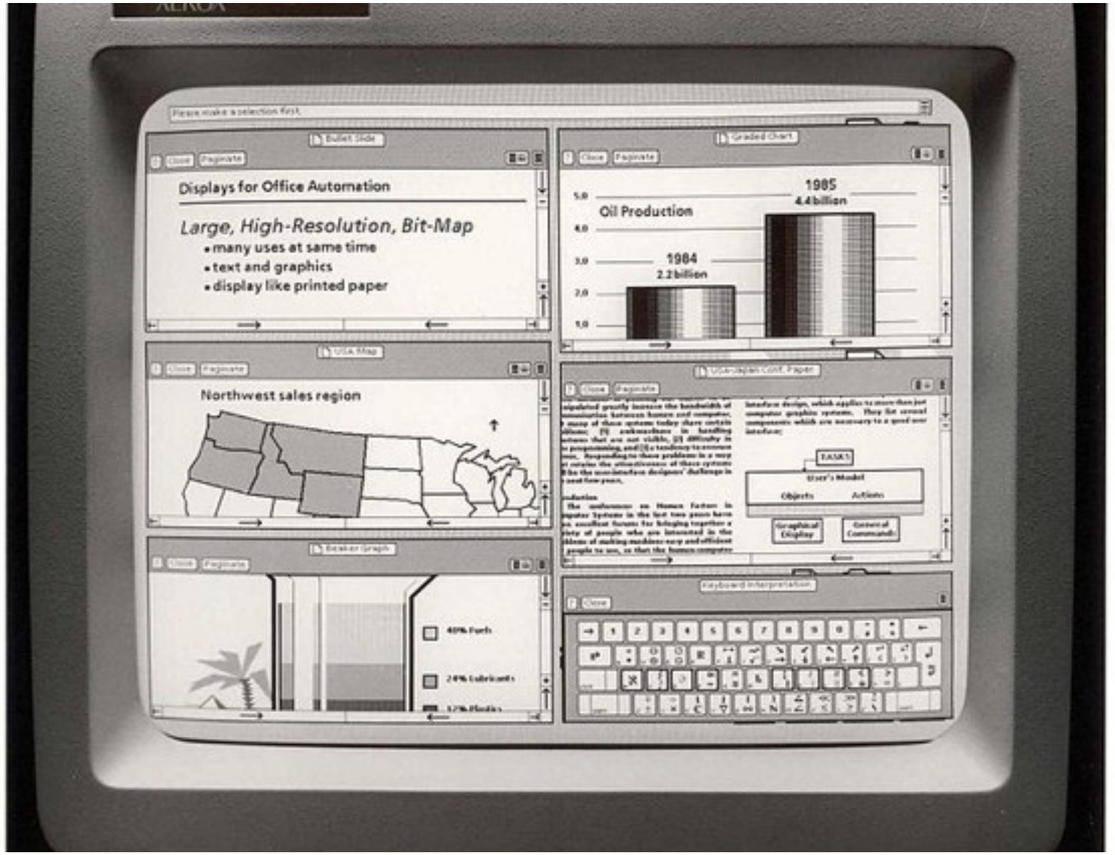
```
println(mouseX + " : " + pmouseX);

println(mouseY + " : " + pmouseY);
```

THE GRAPHICAL USER INTERFACE
图形用户界面

THE GRAPHICAL USER INTERFACE|图形用户界面

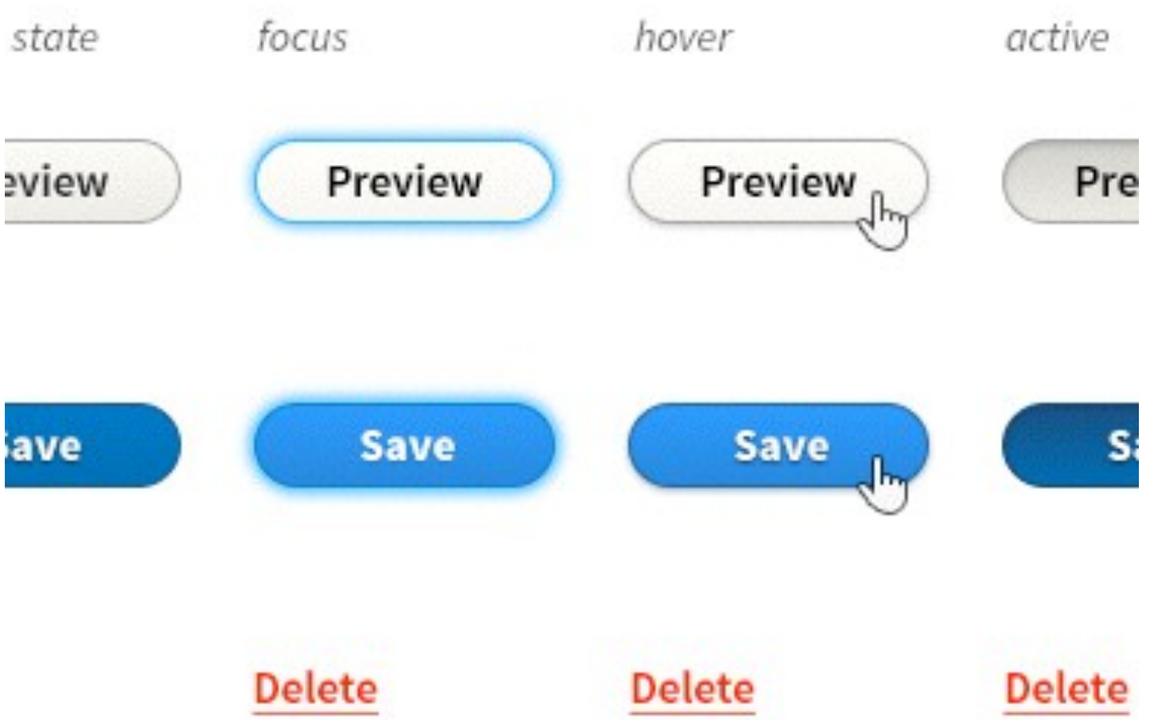
The Graphical User Interface (GUI, pronounced gooey) is the most common system for interacting with computers today.x
When using a GUI, a user interacts with information by manipulating widgets, for example buttons, menus, list boxes, scroll bars, and windows.



BUTTON STATES | 按钮状态

Buttons typically have states so as to provide feedback to users. These different visual and responsive qualities can be based on user input and the overall conditions of the system. Buttons ideally have the following states:

- Normal or Up
- Hover or Over
- Active, Down or Clicked
- Inactive or Disabled



CONTROLP5 GUI LIBRARY

ControlP5 is a GUI library for Processing.

With it, GUI widgets can easily be added to your Processing sketches.
ControlP5 can be installed from within Processing or downloaded from here:

- sojamo.de/libraries/controlP5/

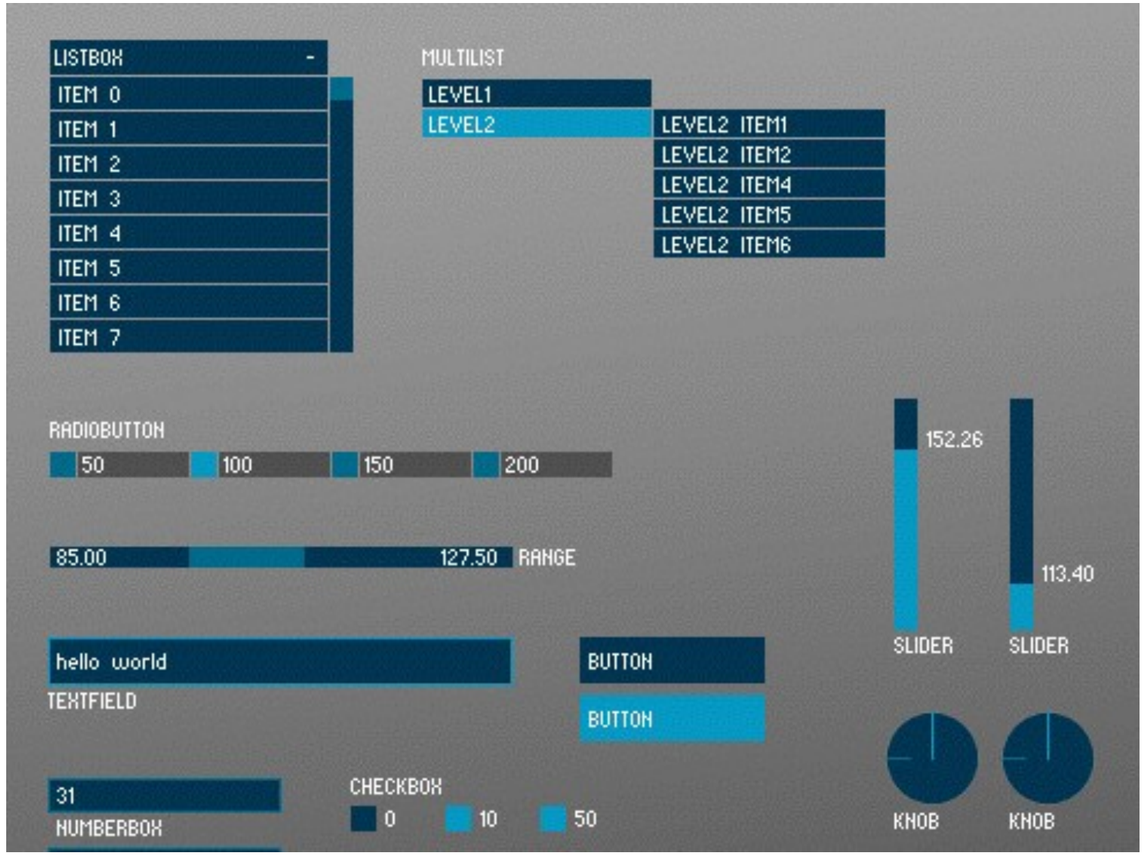


PHOTO FROM SOJAMODE