Hello You

The Middle Path

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Where innovation starts

Processing: After the course

- Use the processing environment and:
- - create programs … that run
- - … that draw pictures
- - … that display animations
- - … that display interactive animations
- - … that animate interactive objects

- last but not least: make all of these work together as you like … great freedom to create

Assignors

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After this 1st lesson: what can you do

- Start processing.
- run your first program in processing
- write programs that create various static objects i.e. “pictures”
- change these programs to change the pictures.
- understand how the pictures change when you change the program.
- have a first idea about creating interactive objects.

After 1st lesson: What should you understand ?

- Why processing (and programming in general) is interesting and important for you as a designer
- what syntax is ?
- what expressions are?
- what (basic) types and variables are ?
- what semantics is ? How to look it up?
- how to think about programs. (a little)

Downloading processing…

Go to wiki created for the assignment:

- **http://wiki.id.tue.nl/creapro**

- **go there and click on:**
- **Prepare your computer for the assignment**
- **then click on the link:**
- **Download processing.** **(a** stable **release)**
- **create a directory "Programs" on the C: disk, in the root. If "C:\Programs" exists already, skip this step.**
- **extract the entire directory to C:\Programs (note, not "C:\Program Files"). if you are reinstalling Processing, remove the entire processing directory first.**

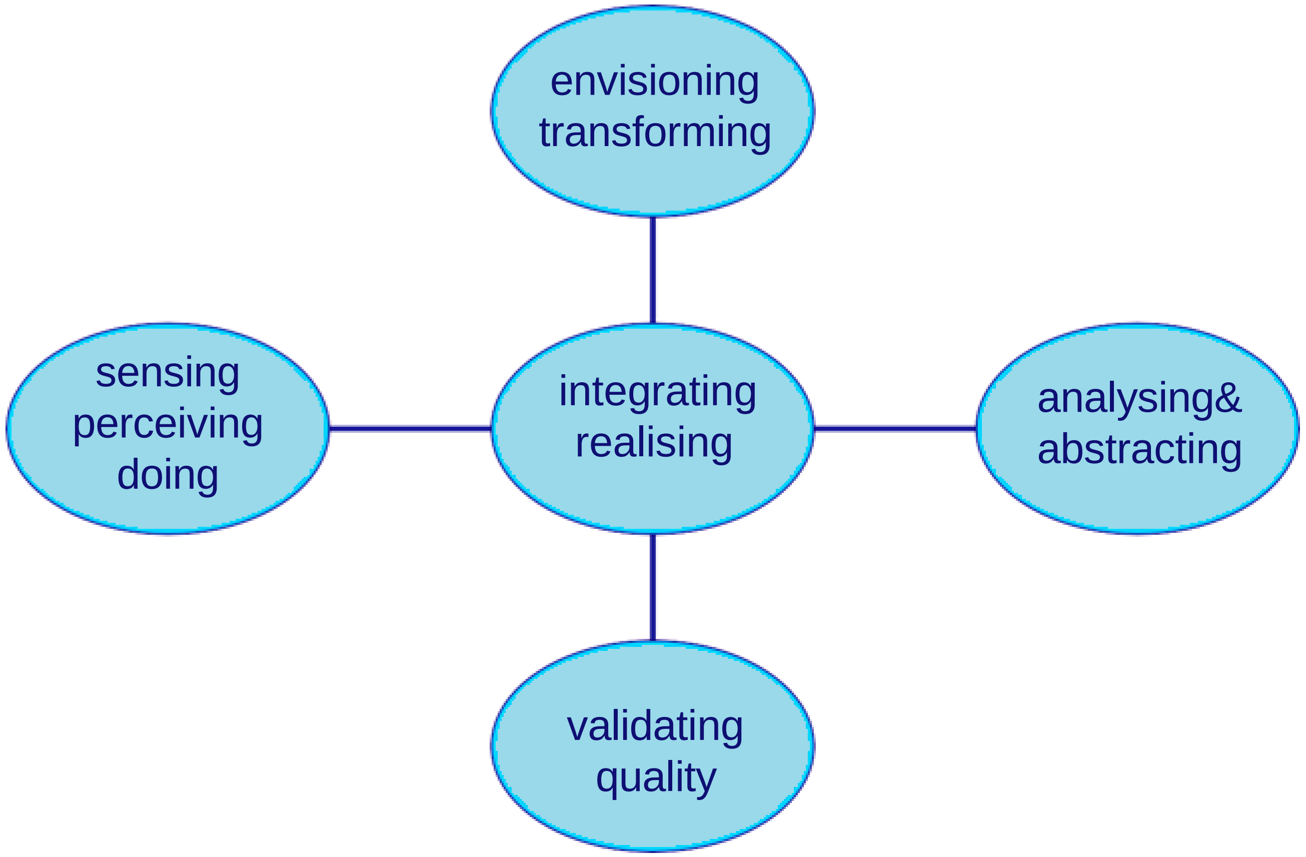
Before you start …
Experience some Examples

- Open menu:
- File | Examples | Basics | Transform |

- run: Rotate

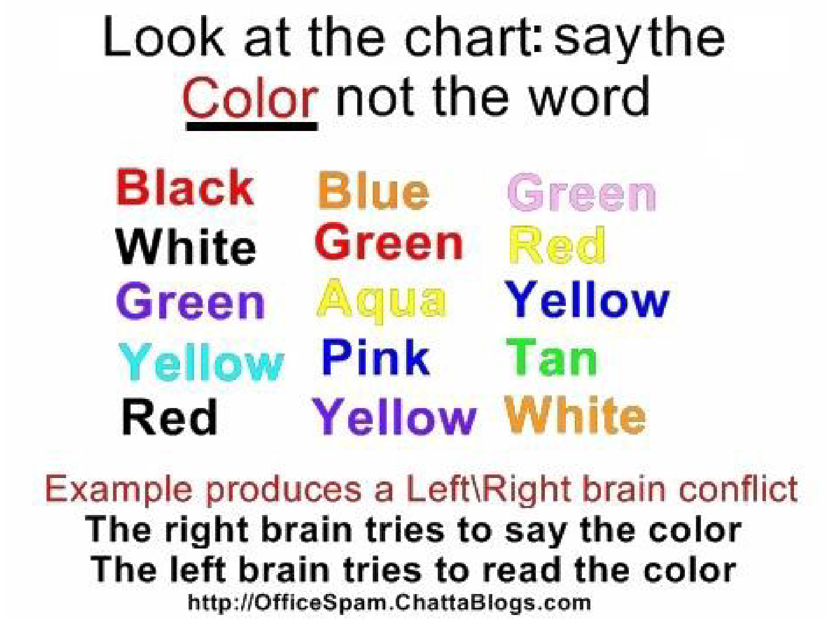
- Open menu:
- File|Examples|Topics|Interaction|
- run: Follow 1
- run: Follow 2
- run: Follow 3

Design Process: integrate various skills



Hummels & Frens: Reflective
Transformational Design model

A little experiment …

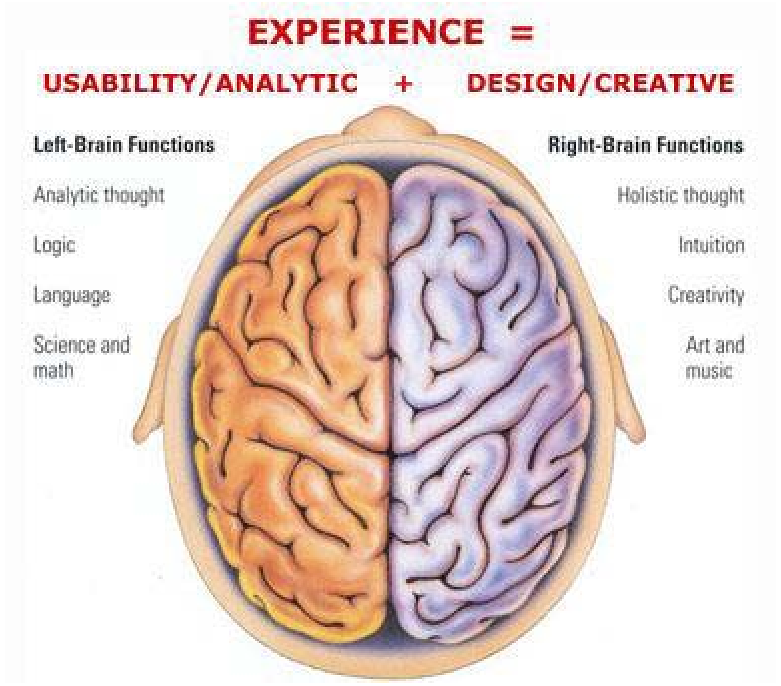


Look at the chart: say the
Color not the word

Black	Blue	Green
White	Green	Red
Green	Aqua	Yellow
Yellow	Pink	Tan
Red	Yellow	White

Example produces a Left\Right brain conflict
The right brain tries to say the color
The left brain tries to read the color
http://OfficeSpam.ChattaBlogs.com

Need to integrate Left & Right brain



Source: http://www.tunghai74.org/letters/Brain-left-right.htm

Left versus Right

- abstract objects that are represented in language are easy to change and to duplicate but are not immediately graspable or visible, and cannot be placed in the relevant context

- concrete objects that are created in matter can be inspected and manipulated easier, but are more difficult to change and to duplicate.

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We want best of both worlds

- define and create objects through language
- grasp and inspect objects through senses.
- Processing can execute abstract instructions in a computer language and translate these into something that you can experience through the senses.

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Programming languages : How does it work?

- **processing is an** imperative **language: that means you use the language to give** commands

- **The computer creates the application by executing the commands one after the other … it is a** sequential **language**

- **compare with written music : parallel (orchestra)**
- **can also be done in programs …very difficult.**

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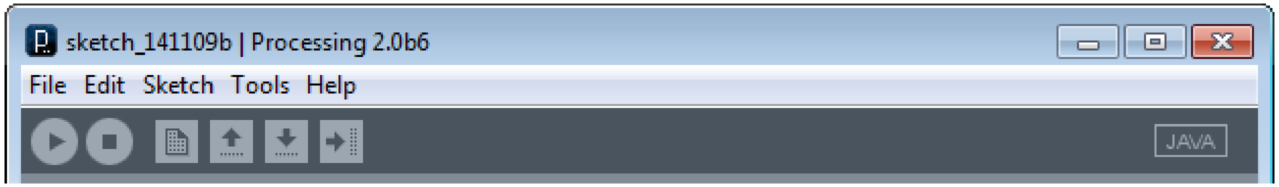
Lets Start Programming…

- **Click on the processing icon …**
- **Window opens with: Run, Stop, New, Open, Save,Export Application (makes applets).**


sketch_141109b | Processing 2.0b6
File Edit Sketch Tools Help
JAVA

First program “Hello you”

- `print("hello you");`

- `print("hello");`
- `print("you");`
- `println("commands are separated by semicolons");`
- `print(5*3);`

- `print("We count"+ 2+1+5+10 + "characters");`
- `print("We count"+ (2+1+5+10) + "characters");`

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Correctness : 3 Levels

- Syntax (language form) : wellformed grammatical expressions: orders of brackets, semicolons, operators, letters and numbers.
- Types (kinds of things) : distinghuish apples from oranges
- Semantics (meaning) : does the program do what you want ?

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Correctness : 3 Levels

- Berlage boult the Schröder house
- Berlage build the Schröder house
- Berlage built the Schröder house
- Rietveld built the Schröder house

Image: Rietveld Schröderhuis HayKranen-20.JPG, Wikimedia Commons

Syntax : wellformed or not ? Try some examples …

- `print("hhhh  ggg");`
- `print("a"); print("b");`
- `print(8); {print(8);}`
- `{{{print(8);}}}`
- `print("hello you)";` ➔ syntax error: perhaps a missing right parethesis
- `//  this is just a comment …..`
- `print("jjjhhh  ) ")` ➔ unexpected token: null
-
- `print("a") print("b")` ➔ syntax error: maybe a missing semicolon
- **commands can contain expressions ….**

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Expressions can be nested ...

- `3*4`
- `sin(3*4)`
- `sin(3* tan(5) / exp(sin(cos(0.45454))))`
- `"abcd"+"efgh"`
- `"abcd" + ("ef" + "gh")`

Types

- String `"hhhheeeee"+ "aaa" + "nnbn99 bnb"`
- int `8   9* 97978787          1-9988989`
- float `2333.5555`
- `sin( -3 * 5677.455)`
- `3.4e+38`
- basic types are: String, float,int, boolean, char, byte,
- (to be continued … can do)

variables

- A variable is a named location where a certain type of value can be stored
- declare; initialize, use, scope.
- `String anExample;`
- `anExample = "fghjkl";`
- `anExample = anExample + anExample;`

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Variable 2

- `int  multiplier = 5;`
- `multiplier = multiplier + 4;`
- `float pi = 3.1415926535897932;`
- `print(multiplier * pi) ;`

SEMANTICS

- **The meaning of the command; this may depend on type.**

- **`int myAge;`**
- **`myAge = 8;`**
- **`print(myAge * 8 );`**
- **`print(" 8 + 8 ");`**

- **`print("I count"+ 1+1+5+10 + "characters");`**
- **`print(myAge+ (1+1+5+10) );`**

- **(to be continued)**

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How to think about commands:

- setting up a picture, or later a stage, using predefined primitives

- first start with a static picture:
- create empty picture with command `size`:

- `size(200,200);`
- Next: specify what you put where:
- you can use various standard primitives with parameters:

- `point(20,45);`
- `line( 0,0,100,150);`

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Example …

- go to menu:

- Example|Basics|Form|
- run: <u>PointsLines</u>

- what is semantics (meaning)
- of : `stroke( 153)?`
- : `background( 0 )?`

Semantics

- To find the meaning look for the (informal) specifications ..
- Select and right click on "`stroke`" to find out …
- choose : find in reference
- Idem on "`background`" to find out …
- these commands <u>specify drawing parameters</u>

Specify drawing parameters …

- `stroke(255);` 255 = white, 0 = black in between are shade of gray ..
- `background(200,23,130);` (e.g. you can also use color)
- `noStroke()` …etc various primitives
- C:/Programs/processing-2.0b6/modes/java/reference/index.html

Also two dimensional shapes are possible …

- `rect(20,20,60,120);`
- `ellipse( 50,50,30,99);`

- **Example|Basics|Form|**
- **run: ShapePrimitives**

Interactive drawings …

- create a stage with :
- `void setup() {`
- `size(200, 200);`
- `}`

- then you can draw … continuously …
- with the `draw` command ..
- For example …

Interactive drawings ...

```
void setup() {
     size(200, 200);
     smooth();              // makes forms smoother
     strokeWeight(2);       // how thick lines are
     stroke(255);           // color of lines (white)
}

void draw() {
     background(mouseX, mouseY, 80); // background color
     line(200, 0, mouseX, mouseY);
     line(mouseX, mouseY, 0, 200);
}
```

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Remark on style …

- proper indentation
- comprehensible comments
- (using Auto Format in Tools menu, if you like it, ^T)

- balanced pictures …
- beautiful movements …

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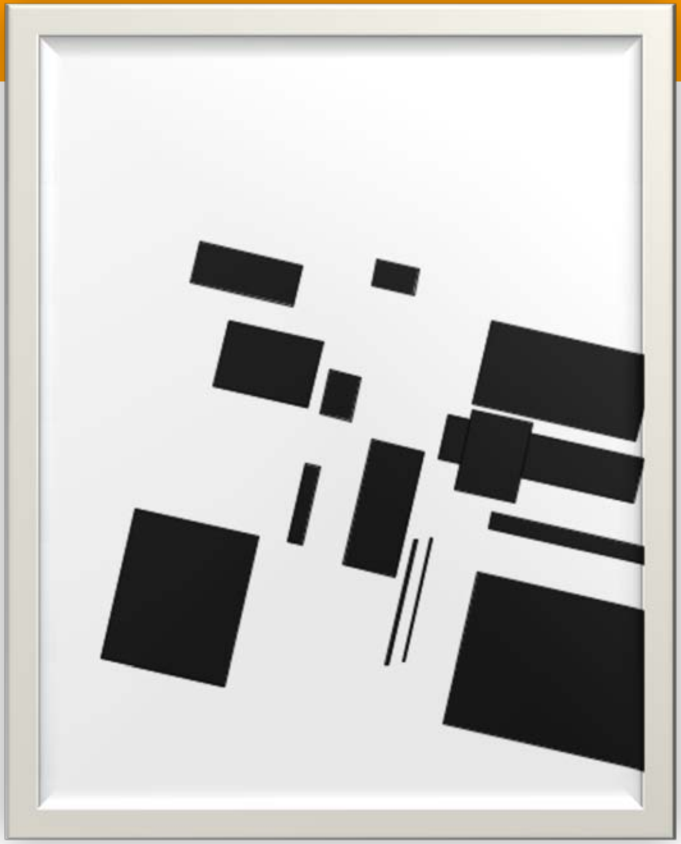
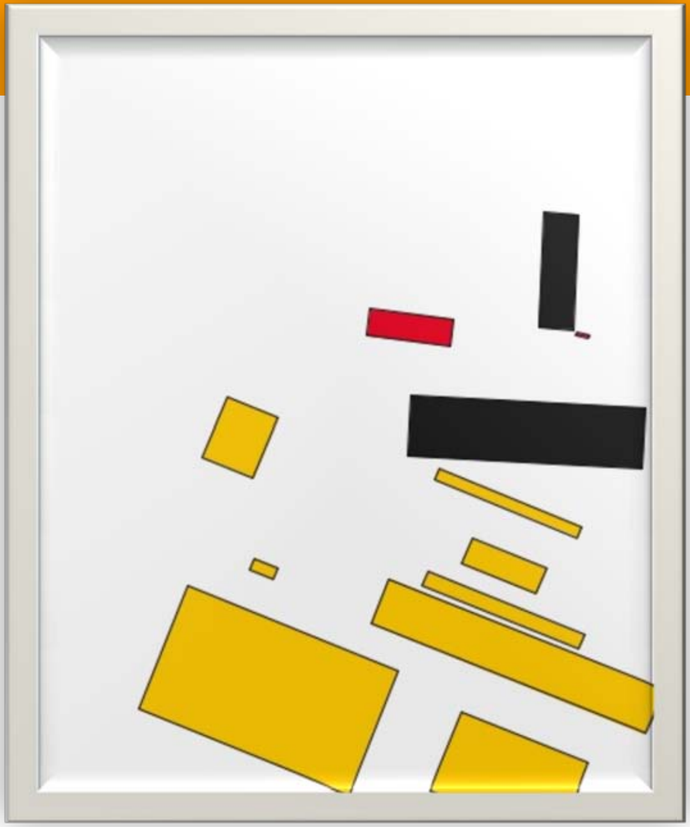
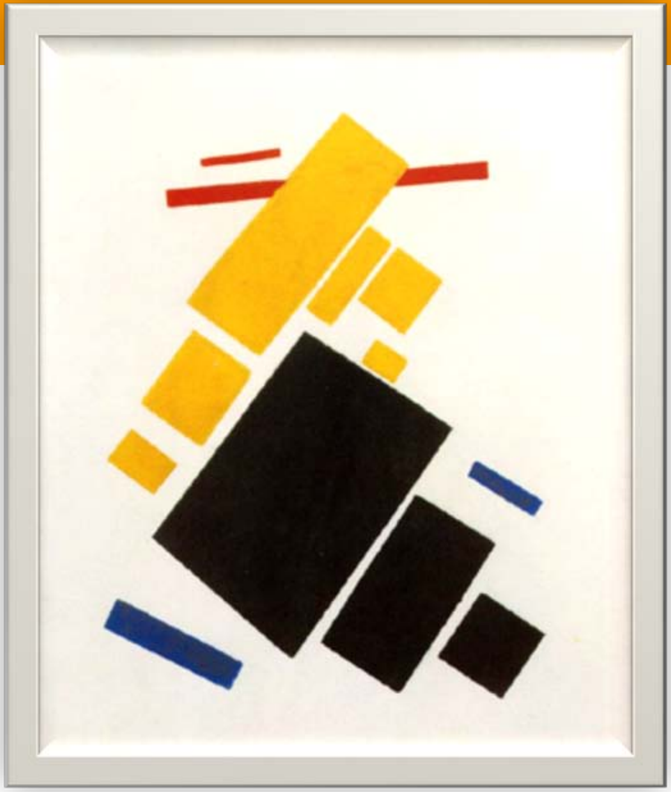
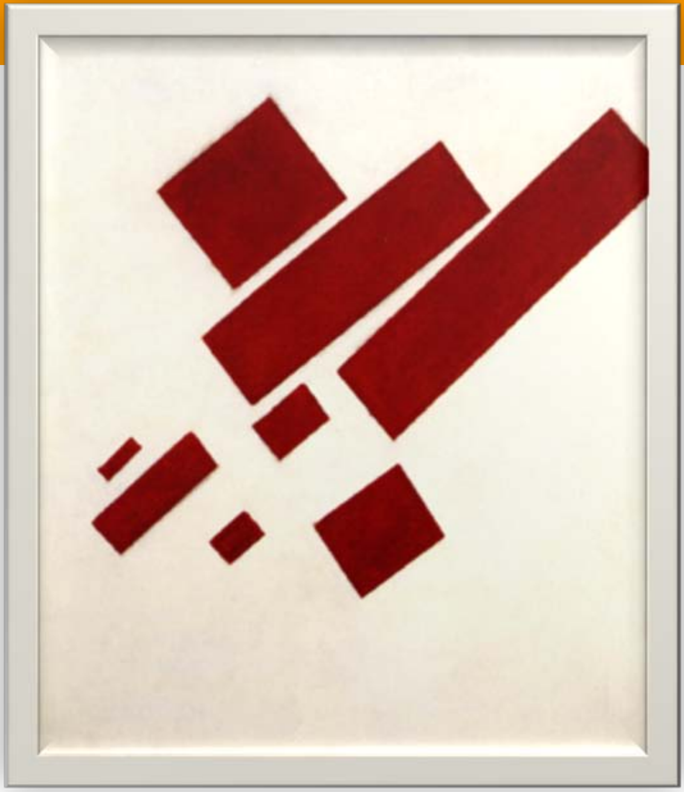
Where we will be in three weeks?


Computer Generated 2012


Computer Generated 2012



Kasimir Malevich, Suprematist Painting: Airlane Flying, 1915.



Kasimir Malevich, Suprematist Painting: eight red rectangles, 1915.

Some getting-started homework for you

Statistics:

- Make a program with variables containing the ages of you and some of your friends
- Let the program calculate the average and the standard deviation and print it orderly using **`print`** and **`println`**

  http://www.mathsisfun.com/data/standard-deviation.html

Geometry:

- Make a program with at least five **`int`** or **`float`** variables to be used as parameters
- Let the program create an abstract geometric composition using these parameters
- Play with the parameters to optimise aesthetic balance