



# Hello You

## The Middle Path

**TU** / **e**

Technische Universiteit  
**Eindhoven**  
University of Technology

**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**

# After this 1<sup>st</sup> 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 1<sup>st</sup> 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 types 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:**

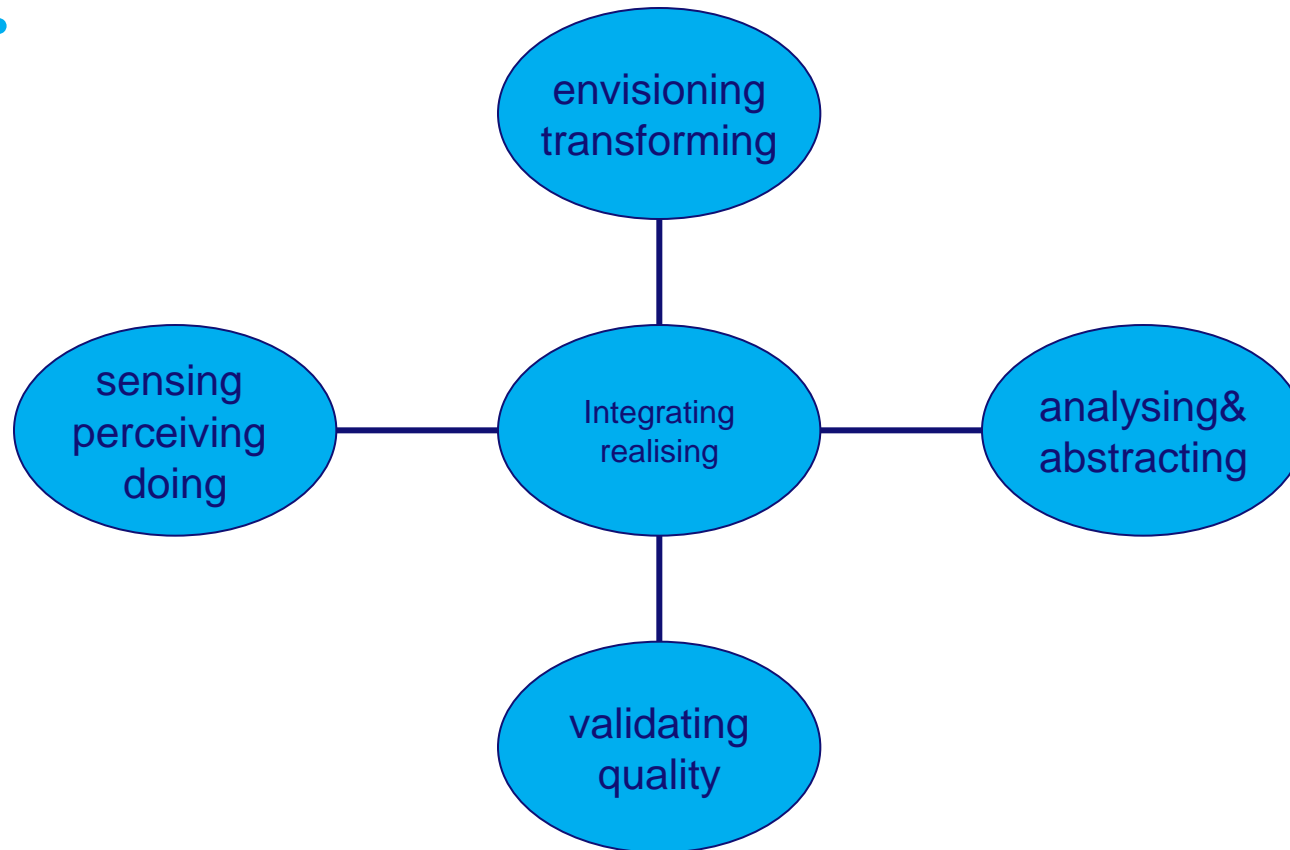
- <http://wiki.id.tue.nl/creapro>
- **go there and click on:**
- [Prepare your computer for the assignment](#)
- **then click on the link:**
- [Download processing.](#)
- **Create a directory "Programs" on the C: disk, in the root. If "C:\Programs" exists already, skip this step.**
- **Extract the entire 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 | 3D and OpenGL | Form |**
- **run: CubicGrid**
  
- **Open menu:**
- **File|Examples|Topics|Interaction|**
- **run: follow 1**
- **run: follow 2**
- **run: follow 3**

# Design Process: integrate various skills



# A little experiment ...

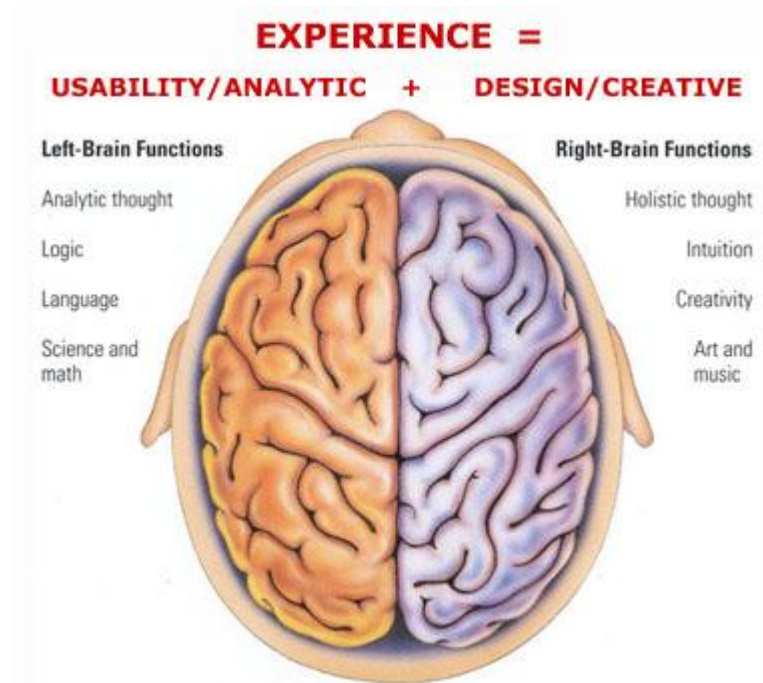
Look at the chart: say the  
Color not the word

<b>Black</b>	<b>Blue</b>	<b>Green</b>
<b>White</b>	<b>Green</b>	<b>Red</b>
<b>Green</b>	<b>Aqua</b>	<b>Yellow</b>
<b>Yellow</b>	<b>Pink</b>	<b>Tan</b>
<b>Red</b>	<b>Yellow</b>	<b>White</b>

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



# 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.**

# 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.**

# 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.**

# Lets Start ...

- **Click on the processing icon ...**
- **Window opens with: run, stop and new,open,save,export. export makes applets.**

# First program “Hello you”

- `print(“hello you”);`
- `print(“hello ”);`
- `print(“you”);`
- `print(5*3);`
- `print(“We count”+ 2+1+5+10 + “characters”);`
- `print(“We count”+ (2+1+5+10) + “characters”);`

# Correctness : 3 Levels

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

# Syntax : wellformed or not ?

## Try some examples ...

- `print("hhhh ggg");`
- `print("a"); print("b") ;`
- `print(8); {print(8); } ; {{{print(8); }}} ;`
- `print("hello you") ;`
  
- `// this is just a comment .....`
  
- `print( " jjjhhh )" ) )` → syntax error: semi expected found )
- 
- `print("a") print("b")` → syntax error: semicolon missing ...
  
- `commands can contain expressions ....`



# 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**
- **(to be continued ..)**

# SEMANTICS

- The meaning of the command; this may depend on type.
- `print(8 + 8 );`
- `print(" 8 + 8 ");`
- `print( " Hello");`
  
- `print("I count"+ 1+1+5+10 + "characters");`
- `print("I count"+ (1+1+5+10) + "characters");`
  
- (to be continued)

# 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)**

# Example ...

- go to menu:
- Example|Basics|Form|
- run: PointsLines
  
- what is semantics (meaning)
- of : stroke( 153) ?
- : background( 0 ) ?

# Semantics

- To find the meaning look for the (informal) specifications ..
- doubleclick on “stroke” to find out ...
- choose : find in reference
- doubleclick on “background” to find out ...
- these commands specify drawing parameters

# 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-0135\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);
- }
  
- the 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);**
- **}**

# Final remark : Style ...

- - **proper indentation**
  - **comprehensible comments**
  - **(using autoformat in Tools menu?)**
- 
- **balanced pictures ...**
  - **beautiful movements ...**