Dessin numérique 2D
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FIRE2
EPFL // ENAC // LAPIS
2018-2019
tips & tricks

Before drawing

part 1
Be smart

Figure out what to produce before starting doing anything
RENDU FINAL

1. Plans, coupe, élévations - échelle 1/50
2. Axonométries - échelle 1/50
3. maquette - échelle 1/20
4. (Détail axonométrie - échelle 1/10)
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SAMPLE OF ELEVATIONS
SAMPLE OF PLANS
1:20

100 cm
"1 : 20"

100 cm
"1 : 50"

100 cm
Think in scale

Graphic = informations
LINES HIERARCHY + DETAILS LEVEL

100 cm
3

Plan your work

from eidotype to details
EIDOTYPE

from greek εἶδος «form, aspect» e τύπος «type, figure, model»].

Quoted topographic sketch of architectural/archaeological element obtained by an euristic immediate observation and used as a basis for a further more precise drawing
EIDOTYPE

1. decide what to survey
2. structure your layout (including name, date)
3. draw your *eidotypes* in a smart scale & position
4. decide + draw dimensions before the survey
5. survey, writing down dimensions on sketch
MAIN ENVELOPE
MORE INFO
What to do and how

Decide what to make 2D, what 3D, which software ...
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DETAILED SURVEY, MODEL AND DRAWING
5

Organize your file

Keep it clean and light
2D simple drawing: the elevations are in a meaningful position.
classes/layers organized to quickly set up printing
define Units

meaningful (type of objects)
Furniture  Architecture  Urban

mm  cm  m
Set up the origin

avoid software troubles + facilitate sharing
DRAW CLOSE TO ORIGIN (0,0)
DEFINE THE ORIGIN \((0,0)\) ON A STRONGHOLD POINT
and don’t change it anymore!
Make everything editable

Blocks, Layers, Styles
USING BLOCKS > ADVANTAGES

1. You can change any number of copies of an object if they are block instances by making changes to the geometry that defines the block.

2. Objects can be updated from external files.

3. Repeated instances of a single definition do not increase the file size much since there is only one actual definition for the block held in the file.
Create Symbol...

- Group
- Ungroup
- Edit Group
- Exit Group
- Top Level
- Link Text to Record...
- Trace Bitmap...
- Edit Constraints...
- Guides
- Poly Smoothing
- Drafting Aids
- Unrotate 3D Objects
- Lock
- Unlock

This menu allows you to manipulate objects in your Vectorworks project.

- Working Plane
- Hatch...
- Trim
- Join
- Add Surface
- Clip Surface
- Intersect Surface
- Combine Into Surface
- Compose
- Decompose
- Convert

These tools are used to modify and manipulate objects in various ways.

Create Symbol...

- Group
- Ungroup
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This feature allows you to create a symbol from your current selection and place it in the symbol library.

The current selection is a dashed line with endpoints labeled as X: -793, Y: 459.
COPY SYMBOL
EDIT SYMBOL
EDIT SYMBOL

↓

FILLET
TUILES
block in autocad
symbol in Vectorworks
component in Sketchup
block in Rhino
Learn how to use Snaps

On / Off / Ortho
Get into the logic of your softwares

think like they do
POP “ARCHITECTURAL” SOFTWARES
"ARCHITECTURAL" SOFTWARES
POST-PRODUCTION

RASTER  VECTOR
MODELIZATION
TECHNICAL DRAWINGS
move/copy  mirror  rotate  circle  array  offset
trim  extend  chamfer  fillet  explode  sketch
ABOUT SOFTWARES’ LOGIC ...

if working with Autocad, remember to close all of your polylines ...

8 PEDIT > M > select all plines > Close

lines
GOOD VS BAD EXTRUSIONS

otherwise, passing to a 3D model, you will go crazy to clean up your drawing, in order to achieve good extrusions.
softwares like vectorworks or illustrator perform better for graphical purposes, mainly thanks to **WYSIWYG** (What You See Is What You Get) logic.
but also because everything has a fill and a stroke, thus providing a lot of actions between shapes not available in linear logical softwares.
once you have a set of intersecting geometries, defining potentially closed areas...
you can start cleaning up your drawing, simply filling the areas in between the lines.
inner boundary polygons

Create a polygon to fit empty space by clicking in empty space that is surrounded by 2D objects.
either you can directly open your dwg or pdf file in illustrator ...
... and you are still able to manage your paths
you can combine objects through the **Path finder**
or, like in Vectorworks, use the shape builder
COPYPASTE BETWEEN SOFTWARES
SOFTWARES TALK TO EACH OTHER
HOW TO FIGURE IT OUT?

help

help

help

help

help
tips & tricks

post-production in illustrator

part 111
Dashes - dotted lines

troubleshooting
ILLUSTRATOR TIP #1
adjust dotted lines - dashes
weight 3
dash 12
gap 12
square cap

weight 6
dash 6
gap 6
square cap

weight 3
dash 6
gap 6
round cap

weight 6
dash 6,6
gap 12,12

Spessore: 6 pt
Estremi:
Angolo: 10° limite: 10

Linea tratteggiata
ILLUSTRATOR TIP #1

adjust dotted lines - dashes

1. To create a square dotted line, make sure the dash and weight is the same value.

2. To create circular dotted lines, select the Round Cap and make sure dash is set to 0 pt. For gap enter a value twice the stroke weight. This will give you a nice circle dotted lines.

3. To expand the dotted lines, you realise Object > Expand doesn’t work. Choose Object > Flatten Transparency to expand it.
Alinea i trattini agli angoli e alle estremità dei tracciati e li adatta regolando la lunghezza.
ILLUSTRATOR TIP #1

adjust dotted lines - dashes

adjust dashes script download
nice free script collections

1. 30+ Must-Have Free Illustrator Scripts
2. Hiroyuki Sato collection
Shapes

there’s lot more to explore
ILLUSTRATOR TIP #2
Pathfinder Panel

- unite/add
- divide
- minus front / subtract
- intersect
- trim
- crop
- merge
- outline
- minus back
- exclude
ILLUSTRATOR TIP #2
Pathfinder Panel

shape modes
- add
- subtract
- intersect
- exclude
- divide
- trim
- merge
- crop
- outline
- minus back

path finders

about the pathfinder panel
Arrange: the position (front/back) of a shape affects the result of pathfinder operations!

about arranging objects
Arrange:
For example the crop generates a shape which is “the front” object cropped by “the back” one.
view tip

Cmd(Ctrl)+Y is the shortcut for Outline View.
Pattern

it’s a pattern world
ILLUSTRATOR TIP #3
Create & edit Pattern

1. Draw the shapes you want to become a pattern;
2. Select shape > Object / Pattern / Create;
3. Set up Name, Tile type (Offset), Width & Height, Overlap;
4. Swatch Panel > apply Pattern to fill of whatever object;
5. Select object > Object / Transform / Rotate (or shear/scale, ...);
6. Uncheck “Transform object”, Check “Transform Pattern”;
ILLUSTRATOR TIP #3
Create & Transform Pattern
Pen tool tip:
holding down “shift” the pen will find the tangent to your curve
Copy shortcut:
drag + alt > copy
drag + alt + shift > copy
in a fixed direction
transform shortcut:
right click on shape / transform / reflect
transform shortcut:
right click on shape / transform / reflect
Pen tip:

start drawing from an anchor point of an open curve: the pen tool will automatically merge the new shape to the previous one
transform tip:
switch on the preview to check what you’re doing.
shape builder:

(shortcut shift + M) select the shapes/lines you want to define an area ...
shape builder:

drag the mouse with the shape builder on: it will create a new shape!
create pattern:
select the shape > object > pattern > create
pattern definition:
give your pattern a meaningful name, so you can start creating your own library :)
pattern definition:
define a portion type according to your design (in this case brick rows with 1/2 overlaying is the right one)
Pattern definition:

Width coincides with the overall shape dimension;

Height is > a rectangle (shortcut M) is a defined geometry for Ai, therefore you can know how “tall” the required distance has to be ...
Pattern definition:
By pasting its numerical value into the “Heighth Pattern” parameter the shapes will create a perfectly continuous pattern.
Pattern definition:
you can always change the fill color or do whatever operation to your shape when within the pattern editor window.
Although the Width is right, there is an annoying double line in the horizontal direction of the pattern...
pattern definition:  

... Which you can fix by decreasing a bit the Width itself, or by fixing the Stroke behaviour (next tip coming soon)
pattern definition:

Now you can draw whatever shape and apply your pattern as it was a normal color fill from the Swatch Palette!
pattern editing:

once the pattern is applied to an object, you can transform it (rotate, scale, etc.) without scaling the whole shape ...
pattern editing:

Go to the transform window
> UNCHECK “transform objects”
> CHECK “transform pattern”
pattern editing: same for rotation...
pattern editing:
or for moving (shifting) the position of the pattern from its starting point...

... how can I know how much I have to shift it precisely?
pattern editing:
by creating a Rectangle
and investigating its
dimensions, of course!
pattern editing: thus pasting the right parameter and so on ...
pattern editing:

those are local transformations: each time you apply the pattern to a new shape it will work as you defined it.
pattern editing:
if you want to create a new pattern out of the one you just made, drag it out of the swatch panel ...
pattern editing:
... and drop it onto your workspace.
It will be automatically converted into a group.
pattern editing: double click to enter the group and edit it as you like, changing colors ...
pattern editing:
When you’re done with editing, simply re-drag and drop it to the swatch panel.
pattern editing:

Now you can apply the new pattern to your previous shape, although you may notice something went wrong ...
If you double click on the pattern swatch, you enter the pattern option panel, here you figure out Ai automatically created a grid pattern version of your previous one, therefore you must give trimmed elements the same color if you want it to be seamless.
pattern editing:

Something you can easily fix by repeating the steps shown above (drag the swatch out, ...).
Selection tool “v” transform the whole object (thus stretching its content)
Direct Selection tool “a” transform the border of the object without affecting its content.
add anchor point

“=”

you can add any number of anchor points to a segment...
Direct Selection tool “a”

... and change shape of your object preserving the characteristics of the pattern you defined before.
Strokes

think like they do
ILLUSTRATOR TIP #4

Stroke panel
ILLUSTRATOR TIP #4

Stroke panel
ILLUSTRATOR TIP #4

Stroke panel
ILLUSTRATOR TIP #4

* Stroke panel
5

Explore

... on your own!
illustrator homeworks

Scaling Strokes & Effects (Tony Soh)
Select objects gallery (Adobe)
Draw with the Pen tool (Adobe)
Tool galleries (Adobe)
create and edit shapes (Adobe)
Create with drawing tools
Organize content with layers
Work with artboards