AUGMENTED REALITY TUTORIAL

by Gilles TARNUS

1- INTRODUCTION :

What is Augmented Reality (AR) ? go to <u>http://en.wikipedia.org/wiki/Augmented_reality</u> To resume : the augmented reality is a term for a live direct or indirect view of a physical real-world environment whose elements are merged with (or augmented by) virtual computer-generated imagery

In this tutorial, you will learn, step by step te way to make an augmeneted reality 3D experience, you will start from a sketchup model (works whit lot of model's formats, thank to blender...)



- a functional brain
- a computer
- windows (but possible whit mac and linux)
- a web cam
- a printer and a A4 sheet (but not necessary, give you tip later)
- some free softwares :
 - Sketchup at http://sketchup.google.com/intl/en/
 - Python at http://www.python.org/download/
 - Blender at http://www.blender.org/download/get-blender/
 - Atomic Authoring tool at http://sourceforge.net/projects/atomic-project/files/

Beware : all this softwares are free for a personnal or educational use, not for commercial use

3- Download and installation :

Download and install by default (next, next ..., finish) lastest version of :

- Sketchup at http://sketchup.google.com/intl/en/
- Python at http://www.python.org/download/
- Blender at http://www.blender.org/download/get-blender/
- Atomic Authoring tool at http://sourceforge.net/projects/atomic-project/files/

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in this order

4- Sketchup :

- open sketchup, and be sure "view => toolbar => getting started" is enabled.

- click on "get model" on browse the google 3d waehouse.

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🟈 truck.skp - SketchUp Pro					
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Animation	Standard Views				
Export scenes to JPG	Walkthrough				

- search for a "good" model : type "truck for augmented reality tutorial" for example.

(by "good" i mean, a model whit front and rear faces whit the same material, only rgb material, no texture) - download it directly in your sketchup model

- place the model
- save the model to "your documents/augmented reality/ truck.skp" for example
- in sketchup go to "file => export => export 3d"
- in the dialog box export the model in kmz format into into "your documents/augmented reality/ truck.kmz" for example



choose kmz(no choose fo free sketchup version)

5- Windows browser :

- go to your file browser in the folder you should have created :

"C:\Documents and Settings\Administrator\My Documents\augmented reality" for example

- you should see the two files you just created : "truck.skp" and "truck.kmz"
- enabled file extension :
 - go to "tool => folder option"
 - uncheck "hide extensions for knows file types



6- Blender :

- launch Blender
- hit delete and accept to delete the small cube in the center of the scene
- go to "file => import => COOLADA 1.4 (DAE)"
- hit "..." in the dialog box to start the brownser
- another window appear,

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		🙊 X3D	& VRML97 (x3d /	/ wrD

- hit "..." to go to the parent folder, and double click to open a folder

- go to "model" folder into the file you just extract : "C:\Documents and Settings\Administrator \My Documents\augmented reality\truck\model"
- and select "truck.dae"
- hit "import dae" hit "import and close"
- the model should appear in the 3d window of blender (sometimes the model is not visible depend of the size tips : hit "A" to selet all, then hit "S" to scale all your objets, move to resize it as needed, hit "enter" to validate
- tips : in blender, orbit = mouse3, pan shift+mouse3, zoom = mouse wheel ;)
- tips : to select an object right click on it, to move select it left click on the winget hold and drag
- hit space then "add = lamp = hemi" or lamp
- tip : copy and paste type "shift+d"





- add many lamps all around the model, and inside if needed, it important !
- export your model in wrml 97 format, go to "file => export => wrml 97"

 Sender

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- hit "ok " in the new dialog box

Selection Only	
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- save "truck.wrl" into "C:\Documents and Settings\Administrator\My Documents\augmented reality"

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7- ATOMIC

- open the Atomic's directory "C:\ATOMIC07"
- go to "marcadores" sub folder and printthe file named : "pattHiro.pdf"
- go back to Atomic directory
- and launch Atomic by double clicking the file named : "ATOMICbeta07i.exe"
- you should the following window appear :



- hit "run"

- make sure you web cam is connected and hold the printed sheet "pattHiro.pdf"
- a dialog box appear, click "ok"

Property Sheet Properties					
Stream Format					
Video Format	Compression				
Video Standard: None					
Frame <u>R</u> ate: 30.000	I Frame Interval:				
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Output <u>S</u> ize:	Quality:				
640 x 480 💌					
OK	Cancel <u>Apply</u>				

- show the black square printed on "pattHiro" to the webcam

- a bee and a flower should appear, when you move (smoothly) the sheet, the model follow it !

- close the webcam window and go back to the Atomic directory
 open the sub folder named : "wrl"
 copy "truck.wrl" model in "wrl" directory
 copy the file named "bud_B.dat" and rename it to "truck.dat"
 "open" or "open whit" (in right click context menu) it whit notepad

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	File: truck.dat			
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- on th - tip : your - close	he line of the text, change "bud_B.wrl" to you can change position, or rotation or model under the notepad and accept to save it	to "truck.wi scale of	File Edit Format View Help truck.wrl # Translation 0.0 0.0 0.0 # Translation 10.0 10.0 10.0 # Scale	
- now name - oper - unde the te for "V - close	go back to Atomic folder and go to sub d : "data" "object_data_vrml" whit a notepad er the text "#pattern 1" change ext "WRML Wrl/xxxx.dat" VML Wl/truck.dat" e the notepad and accept to save it	folder	object_data_vrml - Notepad Ele Edt Format Yew Help the number of patterns to be recognized	
			<pre>#pattern 1 vRML wrl/truck!dat pata/patt.hiro 80.0 0.0 0.0 #pattern 2 vRML wrl/snoman.dat pata/patt.kanji 80.0 0.0 0.0 *</pre>	
- "ope "truc - seard - be su replac - close	n" or "open whit" (in left click context n k.wrl" whit notepad ch (hit "F3") for the word "headlight" ure the following word is "TRUE" if not (ce by "TRUE" e and save	nenu) "FALSE"),	<pre>I truck.wrl - Notepad Ele Edit Farmat View Help #VRML V2.0 utf8 # This file was authored with Bler # Blender version 249 # Blender file # Exported using VRML97 exporter v NavigationInfo { headlight TRUE visibilityLimit 0.0 type ["EXAMINE", "ANY"] avatarsize [0.25, 1.75, 0.] } DEF OB_mesh2_002 Transform { translation 28.011322 37.(rotation 1.00000 0.000000 scale 0.284041 0.284041 0.</pre>	

- go back or launch to the Atomic program and click "run"
- hold the sheet you printed and show the black square to your webcam
- something like this should appear



- if you move the sheet, the model follow it !!!
- Remember you are allowed to use all this programs for personal or educational use

NOT FOR COMMERCIAL USE

- for commercial or other uses, buy : ARMEDIA from inglobetechnologie, on

http://www.inglobetechnologies.com/en/products/arplugin_su/info.php

- for more informations or questions : gta974@gmail.com
- if you need the layout file, .doc or .odt to modify something like language, just ask me
- tip if you have a printer : open the "pattHiro.pdf" and aim the webcam to it
- coming soon, how to display more than 1 model (6 maxi)