**WORKSHOP ABAROMA**

**19-20-21 march 2025**

**INITIATION TO BLENDER ANIMATION AND WEB VR/AR**

**ORGANIZATION :**

* 2 teachers / 2 groups of 15 students
* Schedule :

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **19/03** | | **20/03** | | **21/03** | |
| 9h-12h | Group1 **3D Anim** | Group2 **web VR** | Group2 **3D Anim** | Group1 **web VR** | **Animation** | **Scenography** |
| **Scenography** | **Animation** |
|  |  |  |  |  |  |  |
| 13h-16h | Group1  **3D Anim** | Group2  **web VR** | Group2  **3D Anim** | Group1  **web VR** | **Scenography+Animation**  *«The Shadow Move Contest»* | |

* Prequisites :

**Web VR**

|  |  |
| --- | --- |
| **student skills** | **hardware / software / network** |
| * basics knowledges in code editing * basics knowledges in HTML/CSS | * Hardware : 15+1PC + 1 videoprojector * Software : * VS Code * Internet brower (Firefox, Google) * Network : * internet access (wifi) * List of student mail address |

**Blender Animation**

|  |  |
| --- | --- |
| **student skills** | **hardware / software / network** |
|  | * Blender v4.3 |

**WORKSHOP ABAROMA – 19-20-21/03/2025**

**Introduction**

* ENSAAMA and Numeric department presentation (public school, students, diplomas, erasmus )
  + <https://ensaama.net/site/>
  + <https://ensaama.net/site/home/formations/dnmade/numerique-expriences-narratives-et-interactives>
  + <https://ensaama.net/site/home/formations/dsaa/design-numerique>
  + <https://ensaama.net/site/home/international/genralit-s>
  + <https://ensaama.net/site/home/international/incoming-students>
* Difference between Digital and Numeric Design : the paradigms of the Numeric Department
* Objective of the workshop : basics of 3D animation (blender) and web VR (aframe)
* **a VR round of dancers**
  + **3D animation from 3D models rigged**
  + **Web VR interface coding**
  + **Scenography of 3D animations integration in VR space**
* Prerequisites : basics knowledge in HTML /
* Organization and schedule 19-20-21/03 ABAROMA

**Program**

**Web VR/AR (aframe)**

* **Semantics** :
* **VR technical solutions** :
* **0\_HTML reminders**
* **1\_aframe library**
* **2\_VR workflow : aframe to VR Headset**
* **3\_3D models implementation in a VR scene**
* **4\_3D animations in a VR scene**

**+\_3D models/animation in a AR scene) if enough time**

* **5\_Scenography of animated dancers in a VR scene**

**3D animation (blender)**

**ce sont mes notes**

**WEB VR**

**Part 1**

* **Semantics** :
  + Real, Reality, VR, AR
  + Experience : Body/Time/Space in physical world, Simulation/Immersion/Interactivity
* **VR technical solutions** :
  + Hardware : VR with virtual reality headset (Oculus Quest) for realtime experiences
  + Web VR (with aframe) vs built-in VR (Unity, Unreal) : principles and workflow
  + Web VR
    - Avantages : No installation (dev, user) / Free / Easy development / Accessibility / Low resources
    - Limitations : bitrate / loading / lowpoly
* **0\_HTML reminders**
  + description language / markups / opening & closing tag /
  + structure / html-head-body /
  + HTML attributes, id & class, CSS attributes, # & .
  + Link external files (css, javascript)
  + VS Code / Live server
* **1\_aframe library**
  + free open-source framework for building web virtual reality (VR) experiences
  + easy coding : markup language like HTML, with tags prefix by a- (exemple <a-scene></a-scene>)
  + [**https://aframe.io/**](https://aframe.io/)**,** basic example, library, HTML include
  + spatial orientation, origin, scale, camera
  + aframe help : aframe camera, a-camera, default position, change position
  + aframe primitive, aframe entity as basic aframe element
  + default camera : implicit declaration

**<a-entity camera look-controls wasd-controls position="0 1.6 0"></a-entity>**

**<a-camera id="camera"></a-camera>**

* + visual inspector : <ctrl> + <alt> + i
* **2\_VR workflow : aframe to VR Headset**
  + Principe : local development (vs code, live server) > web server file hosting > internet browser) access
  + Demo on Oculus Quest (with SideQuest and VideoProjector)
  + Github : a cloud-based platform where you can store, share, and work with others to write code
    - repository address : <https://github.com/userid/repository>
    - add file / commit / … delay

remark : Git = decentralized version management software (free, open source, 2005 Linus Torvalds)

* + - web access address : <https://userid.github.io/repository/>

**Part 2**

* **3\_3D models implementation in a VR scene**
  + files formats : obj, gltf/glb, fbx
  + 3D model file format : obj, mtl, jpg files as textures : vertices, edge, face, materials (cube from blender)
  + 3D scenes with 3Dmodels : (download : 3D\_samples.zip > extract.copy in assets directory)
    - obj with no material : 1\_lowpoly\_cat (assets, scale, rotation)
    - obj with data color as materials : 2\_lowpoly\_tree (mtl, multiple instances)
    - obj with file textures as materials : 3\_skull (visual inspector, rotation)
    - glb files
  + Finding and testing models (free, lowpoly)
    - free online repositories :

<https://www.turbosquid.com/Search/3D-Models/free>

<https://sketchfab.com/>

<https://free3d.io/#gsc.tab=0>

<https://quixel.com/>

example <https://free3d.com/> (search critera, model specifications, download options)

* + - * Lowpoly : <https://free3d.com/3d-models/lowpoly>
      * Obj : <https://free3d.com/3d-models/obj>
      * Animated : <https://free3d.com/3d-models/animated>
    - Samples

Obj Models :

* + - * Cat : <https://free3d.com/dl-files.php?p=5b576a4b26be8bed5e8b45b6&f=0>
      * Skull : <https://free3d.com/3d-model/skull-v3--785914.html>

3Dviewer, blender conversion, Gltfviewer, aframe

* + - * Trees : <https://free3d.com/3d-model/trees-9-53338.html>
      * Fish : <https://free3d.com/3d-model/bluegreen-reef-chromis-v2--439073.html>
    - Animations
      * Cat : <https://free3d.com/3d-model/lowpoly-cat-rigged-run-animation-756268.html> (simple animation)
      * Wolf : <https://free3d.com/3d-model/wolf-rigged-and-game-ready-42808.html>

(multiple animations)

* + - * Robot : <https://free3d.com/3d-model/robot-dog-animation-681674.html>
      * Sophia : <https://free3d.com/3d-model/sophia-animated-001-idling-130876.html>
      * Eric : <https://free3d.com/3d-model/eric-rigged-001-771956.html>
    - Viewers
      * online gltf : <https://gltf-viewer.donmccurdy.com/>   
        <https://github.khronos.org/glTF-Sample-Viewer-Release/>
      * online 3D viewer : <https://3dviewer.net/>
* **4\_3D animations a VR scene**
  + animation mixer library (jsdeliver aframe-extras.min)

- aframe extra : <https://github.com/c-frame/aframe-extras/tree/master>

- animation mixer (loader) : <https://github.com/c-frame/aframe-extras/tree/master/src/loaders>

* + simple animation

- installation :

<script src=" https://cdn.jsdelivr.net/npm/aframe-extras@7.5.4/dist/aframe-extras.min.js "></script>

- use : <a-entity gltf-model="#3Danim-glb"animation-mixer> </a-entity>

- examples : flamingo, parrot, stork

* + multiple animations

- syntax : animation-mixer="clip: clipname"

- examples : (Fox : Survey | Walk | Run) (Wolf : 01\_Run | 02\_walk | 03\_creep | 04\_Idle | 05\_site

* + animation parameters

|  |  |  |
| --- | --- | --- |
| **Property** | **Default** | **Description** |
| clip | \* | Name of the animation clip(s) to play. Accepts wildcards. |
| useRegExp | false | If true, interpret the clip string as a regular expression. If false, it is treated as a literal string, except for the \* character, which is treated as a variable-length wildcard. |
| duration | 0 | Duration of one cycle of the animation clip, in seconds. This provides the same functionality as timeScale (apart from pausing), with duration = clipLength/timeScale. This property only has an effect if timeScale is set to 1, otherwise the value of timeScale is used to determine animation playback speed. |
| crossFadeDuration | 0 | Duration of cross-fades between clips, in seconds. |
| loop | repeat | once, repeat, or pingpong. In repeat and pingpong modes, the clip plays once plus the specified number of repetitions. For pingpong, every second clip plays in reverse. |
| repetitions | Infinity | Number of times to play the clip, in addition to the first play. Repetitions are ignored for loop: once. |
| timeScale | 1 | Scaling factor for playback speed. A value of 0 causes the animation to pause. Negative values cause the animation to play backwards. |
| clampWhenFinished | false | If true, halts the animation at the last frame. |
| startAt | 0 | Configures the animation clip to begin at a specific start time (in milliseconds). This is useful when you need to jump to an exact time in an animation. The input parameter will be scaled by the mixer's timeScale. Negative values will result in a pause before the animation begins. |

* + Finding and testing animation (free, lowpoly)
    - * Cat : invisible
      * Wolf : nom des actions
      * DogRobot : tête desynchro

<https://sketchfab.com/tags/glb>

<https://www.turbosquid.com/Search/3D-Models/glb>

Example : Stégosaure

<https://www.turbosquid.com/3d-models/stylized-stegosaurs-game-model-3d-model-1937889>

<https://rigmodels.com/> , <https://rigmodels.com/online/AutoRig.php>

Example : Zombie

<https://rigmodels.com/online/Animate.php?hash=0QO6SHWOJV2MBBHBHUJPLHT0O&model=Tekken_7_Negan_3d_animated>

**+\_3D models/animation in a AR scene) if enough time**

**Part 3**

* **5\_Scenography of animated dancers in a VR scene**

A FAIRE

* **Faire README**
* **Download (**3D\_samples : 3D models, 3D animation samples)
* Upload Github

Bonus :

* composants
* scan3D \_ poly.cam
* AR
* Markdown Language : <https://docs.github.com/fr/get-started/writing-on-github/getting-started-with-writing-and-formatting-on-github/basic-writing-and-formatting-syntax>
* mixamo