INSTITUTO POLITÉCNICO DE BRAGANÇA

Course Unit	Visual Effects			Field of study	Visual Arts/Computer Science		
Bachelor in	Game Design			School	School of Public Management, Communication and Tourism		
Academic Year	2023/2024	Year of study	3	Level	1-3	ECTS credits	6.0
Type	Semestral	Semester	1	Code	8309-801-3103-00-23		

Workload (hours)	162	Contact hours	T -	TP 30	PL 30	TC -	S -	E -	OT -	O -

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s): Guilherme Santos Goncalves, Paulo Ricardo da Silva Alves

Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:
1. Demonstrate abilities to use visual effects software to enhance the look of a digital product (whether it is a game, video or animation);
2. Develop multidisciplinary skills to create cutting-edge visual effects;
3. Understand and analyze different examples of (audiovisual and digital games) good practices in visual effects;
4. Understand the coordination between visual effects and sound effects;
5. Develop all production stages of a scene (vídeo, animation or digital game) to apply visual effects;
6. Know the history of visual effects.

Prerequisites

Before the course unit the learner is expected to be able to:
work with Adobe Photoshop; Illustrator; Premiere; After Effects; Blender and Unity.

Course contents

Theory and history of visual effects; [Mod 1] Composition, blending modes and color. Foreground vs. Background. Motion Tracking. Lighting. Post-production workflow. [Mod 2] Pipeline of visual effects in games. Dynamic cameras. The lighting process in games. Configuration and reuse of visual effects. Advanced use of Visual Effects creation softwares.

Course contents (extended version)

1. The theory and history of visual effects:
   - Evolution of used techniques in the production of visual and special effects.
   - Analysis of case studies, with an emphasis on the production process.
2. Compositing, blending modes and color:
   - Composition;
   - Blending Modes;
   - Masks;
   - Alpha Channel;
   - Mattes;
   - Color Grading and Color Correction.
3. Foreground vs. background:
   - Matte Painting;
   - Rotobrushing;
   - Camera 3D;
   - Chroma key.
4. Motion Tracking:
   - 2D Motion Tracking;
   - 3D Camera Tracker;
   - 3D Motion Tracking;
   - Blender + After Effects.
5. Lighting and keyframes:
   - Lighting;
   - Keyframes and Motion Graphics;
   - Parenting;
   - Dynamics between Softwares.
6. Post-Production Workflow:
   - Post-production;
   - Audio;
   - Video;
   - Red Giant (Magic Bullet looks).
7. VFXs pipeline in games:
   - Visual Effects Concepts (UI, gameplay, environmental, cinematic effects).
   - Workflow, planning & design, technical implementation, analysis of advanced visual effects in games.
   - Comparison between audiovisual and games vfxs pipelines.
8. Configuring and using vfxs:
   - Principles and techniques for creating VFX using Shaders and Textures.
   - Use of particle systems in VFX creation.
   - Post-Processing Effects.
9. Lighting process in Video Games:
   - Importance of lighting in gaming.
   - Creating atmosphere and mood.
   - Influence on gameplay and player experience.
   - Types of lighting in video games: dynamic, baked, mixed, and global illumination.
   - Light Sources: spot light, directional lighting, point light, emissive materials.
   - Reflections.
   - Lighting optimization.
10. Animations and Simulations:
    - Dynamic cameras and user interface animation.
    - Animation and physics simulation of objects.
    - Texture and shader animation.

Recommended reading

1. Brown, B. (2017). Cinematography: Theory and Practice: Image Making for Cinematographers and Directors. 3rd ed. Routledge. [ISBN: 978-1138940925]

Recommended reading

2. Dunlop, R. (2014). Production Pipeline Fundamentals for Film and Games. 1st ed. Routledge. [ISBN: 978-0415812290]
3. Mattingly, D. (2011). The Digital Matte Painting Handbook. Indianapolis, Indiana: Wiley Publishing Inc. [ISBN: 9780470922422]
4. Okun, J. & Zwerman, S. (2020). The VES Handbook of Visual Effects. 3rd ed. New York & Oxon: Routledge. [ISBN: 978-1138542204]
5. Van Hurkman, A. (2011). Color Correction Handbook: Professional Techniques for Video and Cinema. Berkeley, CA: Peachpit Press. ISBN: 9780321713117

Teaching and learning methods

Expositive and demonstrative methods, for contact with the fundamental concepts and their application in case studies, and active method, in which students must take the initiative to solve exercises and carry out work and projects, in order to allow a better consolidation of the acquired knowledge.

Assessment methods

- Final Evaluation (Internal and Mobility): - (Regular, Student Worker) (Final, Supplementary, Special)
  - Practical Work - 5% ([Mod 1] (individual) Exercise "Matte Painting & Color Correction".)
  - Projects - 20% ([Mod 1] (individual) Project "Motion Tracking / 3D".)
  - Projects - 20% ([Mod 1] (individual) Project "Product Advertising" / "Teaser")
  - Practical Work - 5% ([Mod 2] (group) Research and analysis of relevant cases.)
  - Practical Work - 10% ([Mod 2] (group) Proposal and planning of visual effects.)
  - Projects - 30% ([Mod 2] (group) Project between curricular units of the semester.)
  - Projects - 10% ((group) Project developed within the scope of the interdisciplinary week.)

Language of instruction

1. Portuguese
2. English

Electronic validation

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07-02-2024	07-02-2024	07-02-2024	14-02-2024