PROJECT PROPOSAL

STUDENT: Stefano Mei

STUDENT ID: 25100889

COURSE: Programming for Games & VFX Production

PROPOSED SCRIPT: Automated PBR Material Builder per Unreal Engine

TECHNICAL REFERENCE: https://www.youtube.com/watch?v=CHFbrs7qEtE

Unreal Engine Editor Scripting with Python part 8 Automate Material Creation from Texture Maps

1. Introduction and Definition of the Problem

This tool is used to automatically create materials for Unreal Engine. Today, when an artist imports textures (such as ‘stone_albedo.png’, ‘stone_normal.png’, etc.), they have to link them manually within the material. It's a tedious task and easy to make mistakes, especially if you have a lot of assets. My tool does it for you, with just one click.

2. Reference User

Artists who create environments (forests, cities, interiors, etc.)

Artists who work with textures and materials

Small teams or independent developers

In practice: anyone who needs to prepare a lot of materials quickly.

3. Context and Existing Solutions

Doing everything by hand → takes a long time and mistakes are often made.

Dragging textures into Unreal → sometimes works, but not always, and does not allow for advanced choices.

Tools such as Quixel Bridge → only work with certain assets, not with your own.

Paid plugins → expensive and often too complicated.

My tool is free, simple and works with any texture you have on your computer.

4. Proposed Solution

Prepare a folder with your textures (e.g. Rock_Albedo.png, Rock_Normal.png, etc.).

Open Unreal Engine.

Click on a button.

The tool automatically creates a ready-to-use material.

It can handle ‘ORM’ textures (where roughness, metallic and occlusion are in a single image).

It can invert roughness (useful in some cases).

It can also create an ‘editable version’ of the material (called Material Instance).

5. Technical Approach

I use Python (a simple language widely used in VFX/games).

The tool runs within Unreal Engine, as shown in the reference video.

The interface is a simple button in an Unreal window (called Editor Utility Widget).

No external programmes need to be installed: everything already works within Unreal.

6. Final Deliverables

The Python script (pbr_material_builder.py)

3 PNG images showing the starting texture and final material

A PDF user guide (how to use the tool, step by step, with images)

A 10–15 minute video showing how to install and use it

7. Feasibility and Planning

The reference video shows exactly how to do it.

There's no need to invent anything new: I follow what the video does, but extend it a little.

It's a project that's within the reach of a student starting out with Python.

8. Conclusion

This tool saves time, reduces errors, and helps artists work better.

It is simple, useful, and based on a real, working example (the video).

I request permission to proceed with this project.