Lightning generation in images using Machine Learning

TE2502 : Civil engineer thesis topic for game programming students

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Background:

Lightning patterns in images are often useful to convey the weather settings or mood of the environment. Though static lightning patterns can be created procedurally, it is somewhat challenging to capture the entire animation process without physical simulation. In the absence of 3D world description in a single image, this could be hard to achieve.

Aim and objectives:

The aim of this project is to study and extract the lightning animation patterns from available commonplace videos (such as on youtube), that can be used for learning. Then to apply the captured lightning bolts to produce animation in a given image with the help of the state-of-the-art machine learning method. Our method will have the advantage that it would enable generating lightning bolt animations of various intensities in a user supplied image, without using physics or the 3D environment in the image.

Requirements:

- ✓ Student(s) should be advanced level programmers in C,C++
- ✓ Knowledge in GPU programming required
- ✓ Knowledge in Python, Matlab needed
- ✓ Knowledge of Artificial Intelligence and Machine Learning needed

Related links:

[1] Real-time 3D cloud animations using DCGAN, Fredrik Juned and Samuel Asp, Master Thesis, 2020 [Link]

[2] Generation of synthetic plant images using deep learning architecture, Ramya Sree Kola, Master Thesis, 2019 [Link]