Contribution ID: **41**   Type: **Assíncrona**

A framework to generate high quality animations of HEP events

Tuesday, 1 December 2020 10:30 (15 minutes)

Title: A framework to generate high quality animations of HEP events

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Abstract

A framework to animate High Energy Physics events using Blender 3D is unveiled [1]. It consists of Python classes designed to create Blender scenes and drive animations from particle kinematics lists. The base driver class can be derived to interface with different data sources, such as Monte Carlo generators or data files. The Particle class keeps track of particle properties and parameters; it is the base class to implement experiment-specific track-propagation models. In order to animate events observed by the A Large Ion Collider Experiment at the Large Hadron Collider (ALICE/LHC), charged particle trajectories are computed analytically to match the nearly-uniform magnetic field observed at central regions of the ALICE detector.

The framework contains a script written in the Shell language that i) downloads ALICE data from CERN's Open Data portal, ii) uses AliRoot to generate a kinematics file used by the animation driver, iii) generates Blender scenes and triggers its rendering. The script is also capable of iv) composing longer animations of several events in sequence, and combining a mosaic of different cameras using the FFmpeg encoder. A sample of animations based on ALICE Open Data is available for different colliding systems and triggers [2]. It is also possible to generate still STL files for 3D printing or reuse in other 3D software applications. The repository contains detailed step-by-step usage instructions.

Sample animations are available under the terms of the Creative Commons - Attribution (CC-BY) license. Software is available under the terms of the General Public License 3.0 to encourage its reuse and adaptation.

References

[1] https://github.com/AnimALICEData/ALICE-Blender-Animation
[2] https://animalicedata.github.io/sampleanimations/

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Lemos, Breno R., et al; ALICE Open Data Animation from https://github.com/AnimALICEData/ALICE-Blender-Animati
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Palavras-chave

Animation, Open Data, ALICE, Blender

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Session Classification: Contribuições Orais - Desenvolvimento de Material Didático 2