



Synopsis

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Implementing Splines and Usage Tutorial System for OpenFOAM GUI

This research migration describes the software development process of an OpenFOAM spline interpolation tool in Blender [1] and a teaching system in PyQt5 as an addition to Venturial [2]. OpenFOAM, a popular open-source computational fluid dynamics (CFD) program, uses splines as one of the curve definition methods. However, for users without prior expertise or specialized knowledge, building and manipulating splines in OpenFOAM might be difficult.

To overcome this issue, we suggest a Blender-addon that facilitates spline construction for OpenFOAM. Users would be able to create, edit, and change splines with the simple controls and tools. It would provide options for defining handles, control points, and spline interpolation techniques. The panel would improve productivity by streamlining the process.

Additionally, we suggest PyQt5 to integrate a tutorial system into Blender to aid in the learning process for OpenFOAM's spline construction. Users get the ability to efficiently design complex shapes, which alleviates the learning curve and enhances productivity. It would be possible to effortlessly install the addon and the tutorial system into Blender.

[1] Blender, "Blender 3.5 Reference Manual — Blender Manual," Blender.org, 2023.
<https://docs.blender.org/manual/en/latest/>

[2] R. Adak, J. S. Murallidharan, and P. Ramachandran, "Fossee/Venturial: Venturial is a GUI for openfoam.," GitHub, <https://github.com/FOSSEE/venturial> (accessed Jul. 4, 2023)