Animating the Virtual Human: Applying movie-industry tools and techniques to data visualization

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1. Abstract

Impactful and memorable images are a great resource for science dissemination, improving the reach and engagement of complex and information rich topics. Yet scientists in general do not have the training nor the time to create high quality and appealing imagery, and journalists and designers do not have a deep understanding of the data itself nor the tools to deal with scientific datasets. On its own, each group can more easily fall into the traps of either detailed but uninteresting imagery, or non-rigorous "artist's rendition" style of visuals generally dismissed by the domain scientists. However, when both scientists and designers work together, they can create accurate and appealing images and stories. Furthermore, from the interaction new approaches appear, like the one we present here. Inspired by popular web libraries that have allowed journalists and designers to incorporate data in their workflow and produce high quality visualizations, we created a pipeline and a set of tools that allow designers and animators to import large scientific datasets (from 3D simulations) directly into industry level software tools (Maya, Blender, Adobe suite, etc.) where they can control and manipulate the visual style more precisely, and reach higher levels of visual quality than with scientific visualization tools. On the other hand, the scientists can become more than simple advisors to the designers, and (thanks to the automation afforded by the coupled tools) create new visualizations for their publications and presentations.
We will focus this presentation around Virtual Humans (https://youtu.be/_rMaN1zAGxY, fig. 1), and our latest work using data visualizations for dissemination purposes (fig. 2).
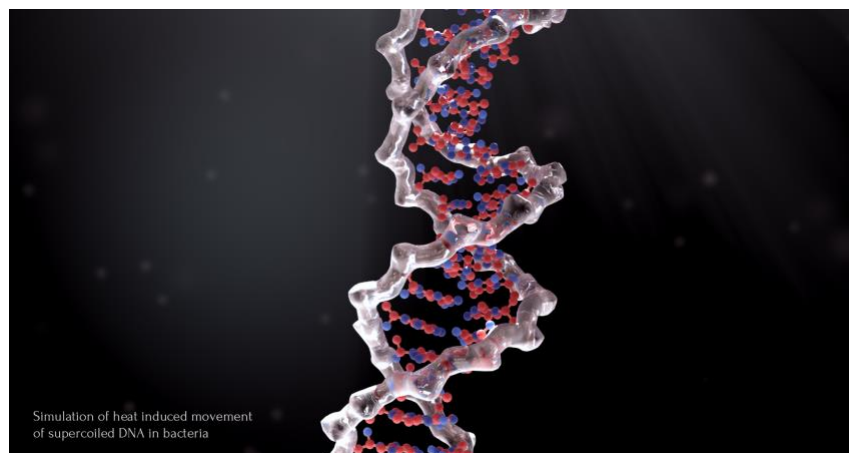
Figure 1 *Visualization of supercoiled DNA in bacteria from the short documentary Virtual Humans*
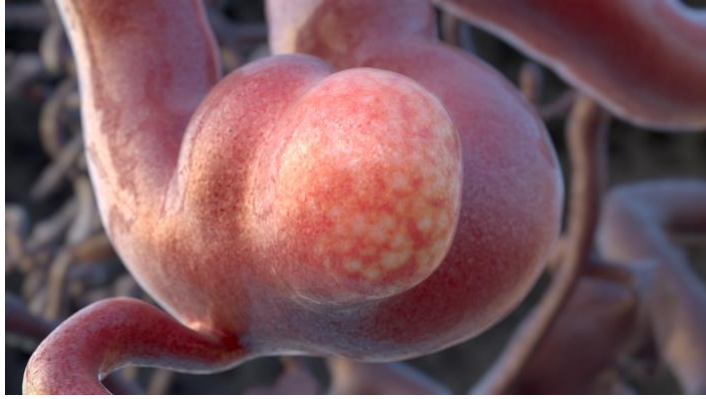
Figure 2 Photoreal rendering of the computational mesh derived from an intracranial artery with aneurysm