

Animating the Cardiac Cycle in Cinema 4D

By Eric Small

Objectives:

1. An accurate understanding of the cardiac cycle:
 - Anatomy and physiology of the heart, including the functionality of various structures and their interaction with the cycle.
 - Detailed explanations of each phase of the cardiac cycle and how specific deformers can emulate that particular phase.
2. Efficient rigging techniques using deformers:
 - The approach of using multiple deformers to create an organic motion for greater flexibility later in production
 - Deformers used in lieu of pose morphs to allow for additional objects to move while remaining registered with the heart
3. Control simplification through Xpresso (time permitting):
 - Methods to consolidate multiple deformers into a single slider for streamlined animation.
 - Creation of additional controls for features like heartbeat strength and visibility of structures.
 - Ability to create a custom user interface to leverage these controls in a convenient location.
4. Technical insights:
 - Workflow optimization and practical tips for future Cinema 4D projects.

Webinar Outline

1. Foundation and anatomy:
 - Begin with an explanation of the cardiac cycle.
 - Discuss the mechanical behavior of the heart and fluid dynamic of blood, and their effect on the valves and their unique non-muscular operation.
2. Using deformers in Cinema 4D to create motion:
 - Demonstrate how to use deformers to simulate realistic cardiac movements with minimal pose morphs.
 - i. Deformers will be used to drive the movement of each chamber of the heart

- ii. Types of deformers to be used include but not limited to: Displacer, Twist, Bulge.
 - iii. These deformers will be restricted in their influence by using both Fields and Vertex Maps.
 - Highlight the adaptability of this rigging method for various heart states (healthy and diseased).
3. Control setup with Xpresso (time permitting):
- Build an intuitive control system to drive the animation using sliders.
 - Implement additional features such as heartbeat strength adjustments and structure visibility toggles.

Presenter Bio

Eric Small is a Senior Medical Animator and Director at MadMicrobe Studio, where he has been contributing his expertise since 2020. With 15 years of experience in medical animation, he has worked on a diverse range of projects spanning molecular biology, gross anatomy, and various scientific disciplines.

Beyond his deep understanding of scientific visualization, Eric is highly skilled in animation techniques, particularly within Cinema 4D and After Effects. He shares his knowledge through technique videos and frequently guest lectures for the UIC BVIS program, where he earned his Master's degree.

When he's not crafting compelling visual narratives, Eric enjoys the outdoors—spending his free time skiing, mountain biking, and hiking.