# Abstract Design for Time-Based Rigging Solutions in Computer Graphics Education

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A marked challenge for students in technical three-dimensional computer graphics education is the ability to overcome the technical and to think abstractly. Solving complex problems where there is no predefined solution is a significant obstacle. Software agnostic theory and practice is the cornerstone of understanding available tools independent of software. Breaking down challenges into basic components allows for quick testing solution exploration. This exploration, utilizing simple processes, allows for abstract designs to overcome the reoccurring basic components of rigging in computer graphics. Proposing simple solutions to problem components, then adding in variables to test and alter the proposition to arrive at a possible solution is a pathway to success.

Finding simple solutions requires breaking down the situation to core obstacles. Discerning what steps can be taken to solve each factor. Then making the proposed solution time-based. Next testing the system, or which variables need to be strengthened to create more stability? Lastly, what can be done to simplify or reduce cost.

Analyzing several case studies shows how solutions are proposed and evolve: *X-Men Days of Future Past*'s (2014) Beast transformation, *Life of Pi* (2012) sticky skin, and *Yogi Bear*'s (2010) collar.

**Keywords**
Rigging, Design, Computer Graphics, Animation

**Biography**

**Ryan English** is an Assistant Professor of Simulation, Animation & Gaming in the School of Visual & Built Environments, College of Engineering & Technology at Eastern Michigan University. Ypsilanti, Michigan, USA. Ryan holds a BS in Industrial Design and an MFA in Design both from The Ohio State University, Columbus, OH, USA. Before becoming an educator, Ryan spent more than ten years as a Character Technical Director, Rigger, and Character FX Artist with Rhythm & Hues Studios and Sony Pictures Imageworks. Research interests include character development, procedural animation, small scale additive manufacturing, extended reality, and storytelling.