



Blending Analog and Digital: 2D Advanced Rigging and Stop Motion

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ABSTRACT

This research explores a hybrid animation workflow that combines stop motion with 2D advanced rigging. The project aims to create a short animation sequence demonstrating seamless integration of these techniques, expanding the boundaries of visual storytelling. Key objectives include developing workflows to merge stop motion and 2D rigging, applying motion data from physical models to digital techniques like smears and inbetweens, and experimenting with calibration methods to unify analog and digital elements. The study employs a range of tools and materials, such as cameras, lighting setups, handcrafted props, and animation software for rigging and compositing. Drawing inspiration from films that merge animation styles, the research investigates the technical challenges and creative opportunities inherent in hybrid animation. This research enhances the artist's ability to adapt to diverse animation projects, fostering versatility and creative growth. Furthermore, it contributes to the field by offering insights into the artistic and technical integration of stop motion and 2D rigging. The findings aim to serve as a resource for animators, educators, and researchers exploring innovative hybrid animation workflows.

METHODOLOGY

Research & Planning

- Planning a starting workflowsblending stop motion with 2D rigging
- Identify challenges and solutions

Pre-Production

- Design characters and scenes for hybrid animation
- Build physical puppets with armatures
- Create 2D rigs in Toon Boom Harmony

Production

- Animate stop motion in Dragonframe
- Extract motion data & apply to 2D rigs
- Synchronize movements for seamless integration

Post-Production

- Composite stop-motion & 2D animation in After Effects
- Add effects, refine timing, and polish visuals

Evaluation & Refinement

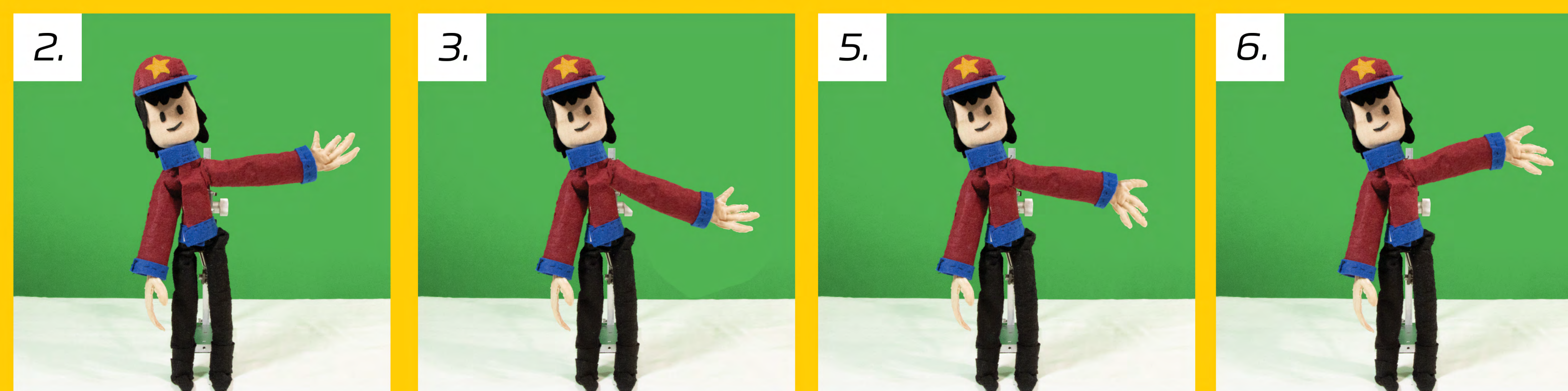
- Gather audience feedback & analyze workflow
- Document findings for future hybrid animation research

STOP MOTION KEYS



Stop motion main keys. These are the primary poses that will dictate how the character would move and interact in the animation.

2D RIGGING KEYS



2D inbetweens. These 2D rigged animations are set inbetween the stop motion aspect of the animation to enhance the movement of the character.

2D RIGGING INTERGRATION

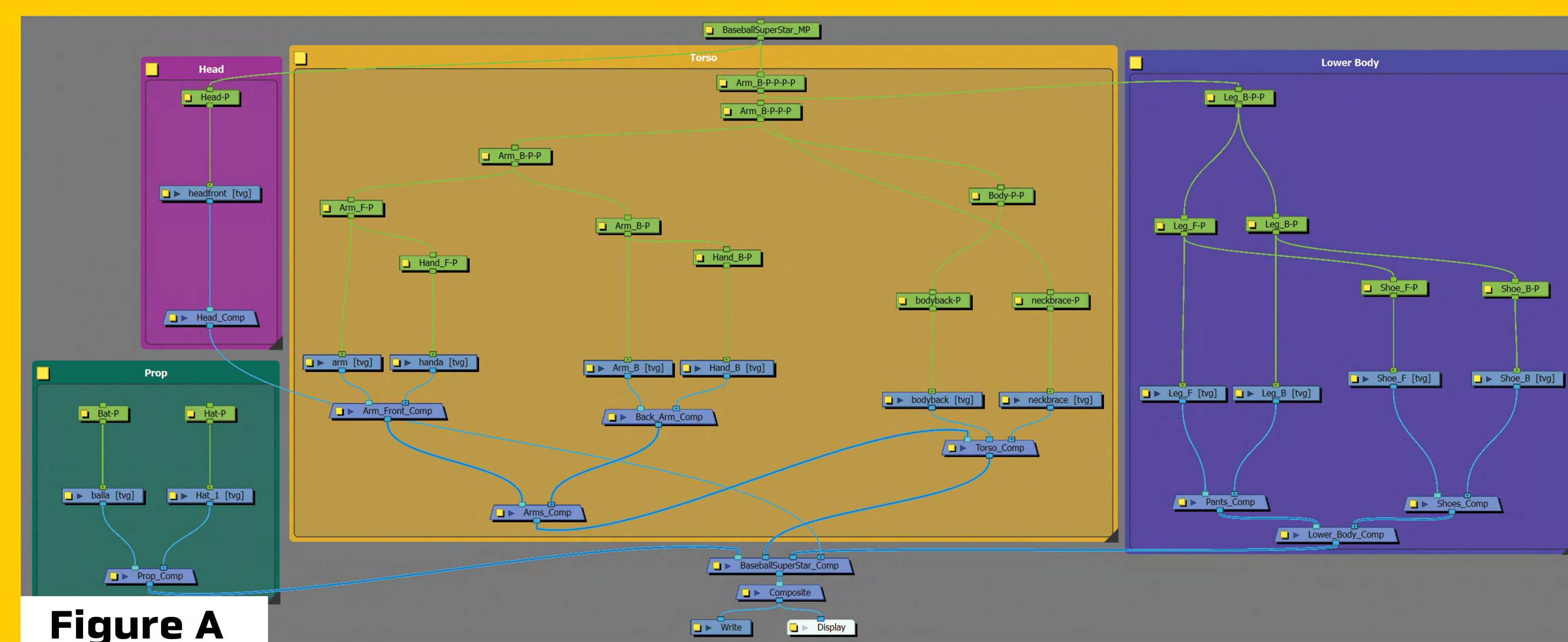


Figure A

[Figure A] is set up so the 2D portion of the process can be manipulated into modifying the physical puppet. Example: **[Figure B1]****[Figure B2]**

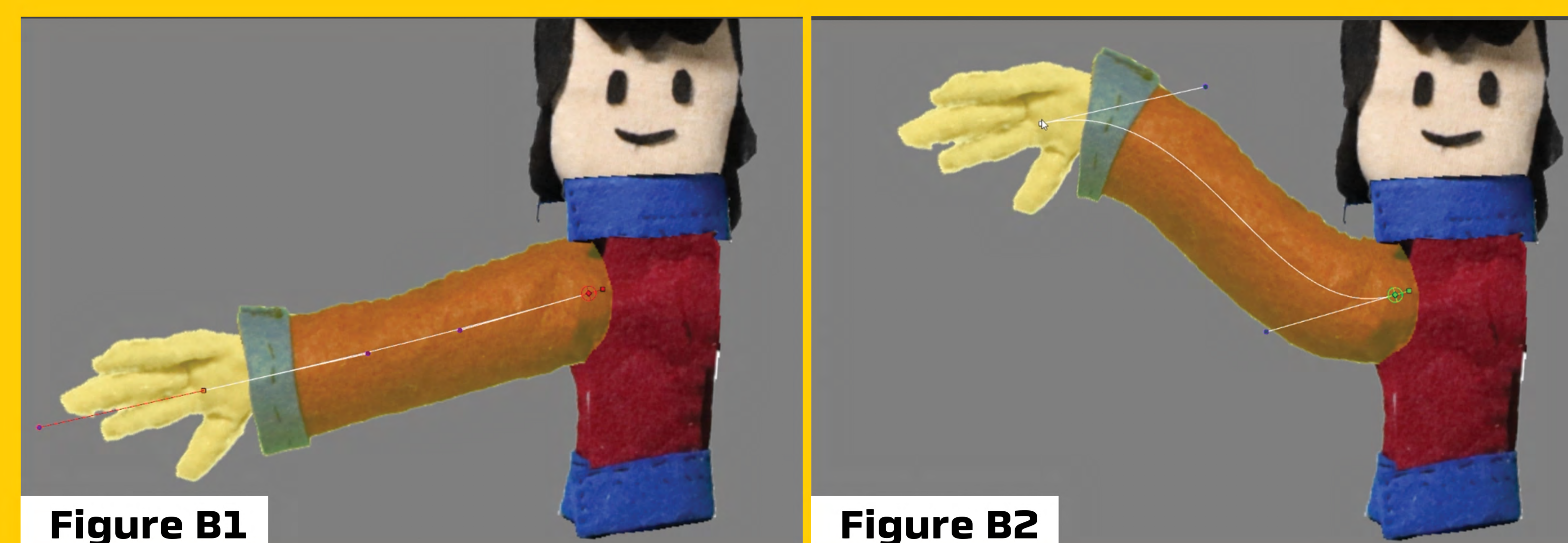


Figure B1

Figure B2

PROJECT INSPIRATION AND GOALS

- Document the hybrid animation process of 2D & Stop-Motion
- Explore innovative visual storytelling methods
- Blend animation aesthetics for creative & technical inspiration
- Equip animators with adaptable workflows

Examples:

1. *Kubo and the Two Strings* – Stop-motion + digital editing to enhance technology
2. *Spider-Man: Across the Spider-Verse* – 2D + 3D hybrid to elevate narrative

STOP MOTION WORKSPACE



This is a general process of what a stop motion animator would be working on.

INDUSTRY APPLICATIONS

Hybrid animation is increasingly relevant in modern storytelling. This can lead to:

- unique job opportunities.
- new software tools tailored for hybrid animation.
- Preserves puppets by reducing excessive wear and tear, minimizing the need for costly replacements.
- Saves time and resources by using digital rigging for complex movements instead of physically modifying puppets.

ACKNOWLEDGEMENT

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Kubo and the Two Strings. Directed by Travis Knight, Laika, 2016.
Spider-Man: Across the Spider-Verse. Directed by Joaquim Dos Santos, Kemp Powers, and Justin K. Thompson, Sony Pictures Animation, 2023.