

Efficient 3D Storyboarding in 3D Game Engines

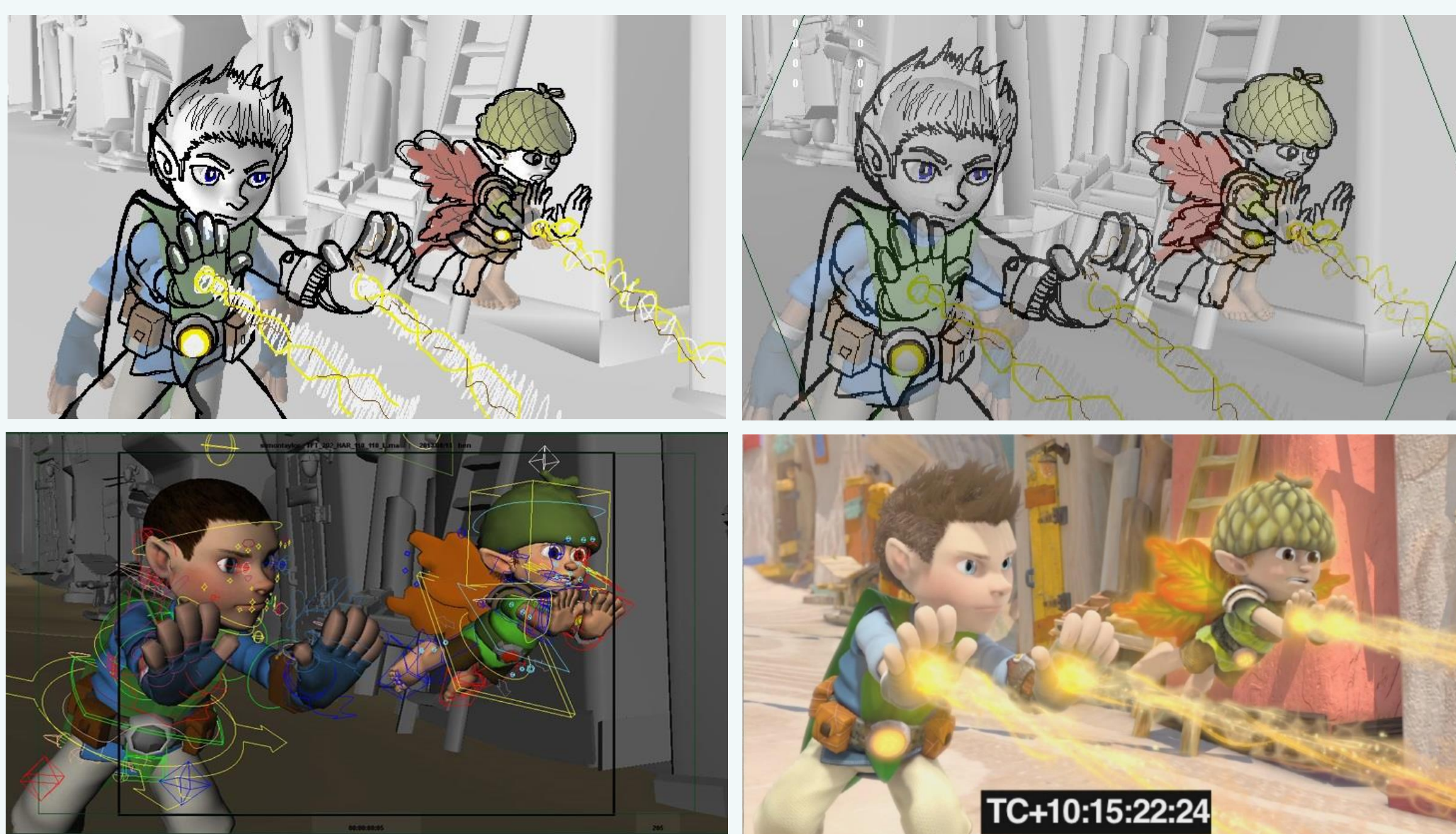
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Introduction

- Getting an accurate match between initial storyboards and the 3D layout is difficult, given today's reality of multi-site productions. Going back to make corrections is the difference between delivering on time or going over budget.
- Studios can avoid mistakes and deliver on time by storyboarding directly in 3D, with the help of game engines.
- Thousands of minutes of animation have been created in this way, for productions such as "Bob the Builder" and "Tree Fu Tom".



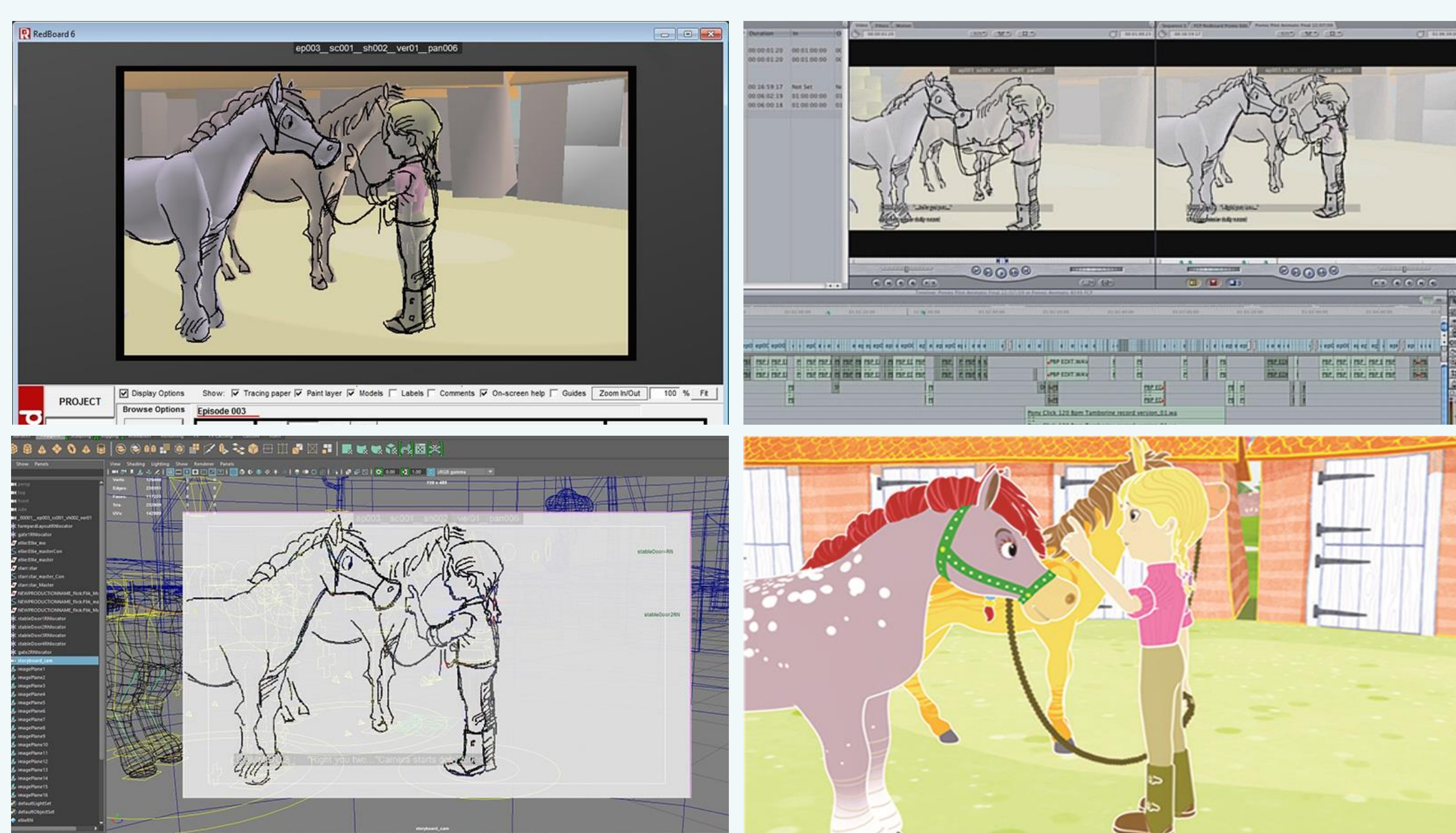
Results

- The proposed pipeline system has been used in various productions such as "Bob the Builder", "Rusty Knight", "Fireman Sam", "Tree Fu Tom" and "Q Pootle 5" to create entire series. Some producers schedule for 3 approval stages during a 9 week period, while each storyboard takes 3 weeks (including a blocking approval).



Methodology

- The relationship between 2D drawings and 3D assets can have interesting applications [GX15]. Storyboard artists explore the 3D set with a camera to find the best framing for their shot. For this reason, interactive solutions are preferred [LLL * 15].
 - Once they have chosen their framing, they can place characters into the shot.
 - Once the "blocked-out" shots are approved by the director, the artists begin drawing details on top of the 3D scene.
 - Drawings provide information such as character poses, expressions and effects like fire.
- The **3D assets** (in the game engine), the **2D drawings** (drawn by the artists) and the **timings** (set by an editor) are the three elements needed to automatically create the first pass of **3D layout**.



Conclusion

- This paper proposes a method to improve pipelines for 3D animation productions by optimising the link between 2D storyboards and 3D layout. Game engines offer real-time response with full production quality [Mor15], making excellent back-end technology for storyboarding in 3D.
- Leveraging 3D game engines for storyboarding empowers:
 - **Directors** as they can be sure that when a shot is approved at the storyboard stage, it will closely match the shot at the final render stage.
 - **Storyboard artists** as they can explore the set in real time, avoid common mistakes and be confident that their work will reach the final output.
 - **Producers** as they can access detailed breakdowns for every episode such as shot names and durations, lenses used, character distribution, prop population and much more.
 - **Layout artists** as they no longer have to do guesswork and tedious corrections.
- Once the connection between 2D and 3D exists, additional improvements open up, like automatically posing the 3D models to match the storyboard drawings [GXMZ14].

References

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