

Playing Audrey II: Creating a Digital Actor Through Game Technology

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1. Introduction

The fields of 3D computer animation and digital game design owe a great deal to traditional performance practice and theory, particularly in terms of creating emotionally resonant digital characters. Digital actors can hold their own with live actors on film, but are rarely used in live stage performance. This talk discusses how a team of faculty and students in game development and animation joined forces with faculty in music and theater to bring a digital character to life on-stage through the use of gaming technology. This talk also discusses how our methodology can effectively improve the development of interactive digital characters in the future, in terms of technology, production pipeline, and approaches to performance.

2. Challenges

The musical *Little Shop of Horrors* and its character, Audrey II, a blood-sucking alien plant that grows to enormous size and eventually eats whole people, presents an opportunity to create a digital character that may be more emotionally engaging than the traditional actor-controlled puppets usually built or rented for productions. Audrey II is introduced as a small plant in a pot, but grows to an enormous size by the end of the show. The larger Audrey II characters are usually performed with two puppets, one about the size of an adult man, and another that can be twenty feet tall. The puppets are expensive to build or rent, difficult to manipulate, and have a severely limited range of motion and expression. Coupled with the fact that the plant is literally “rooted” to the stage in one spot, this can make Audrey II a very boring character to watch, relying almost completely on her voice actor to bring her to life. Clearly, the opportunity to merge digital technology with live theater could improve the performance of a character like Audrey II.

3. Production Pipeline

At the University of Texas at Dallas, the authors of this talk chose to include Audrey II as a character in a musical revue show entitled *Best of Broadway*. Faculty and students went through a blended game, animation, and theatrical production schedule to create and rehearse with the Audrey II character, including 3D modeling, rigging, and character animation techniques, motion capture and facial animation techniques, virtual environment creation, game control and interface design, and a significantly modified rehearsal schedule in which actors, animators, and the Audrey II puppeteers modified both the controls and the animations of the digital character based on its performance with live actors and musicians. Technical challenges included using the Unreal Development Kit (UDK) to create and project a digital set that blended with a stage set; using FaceFX to create believable lip motion for a non-human face; using FaceFX to create lip movements for singing as well as speaking; and creating



Figure 1. Audrey II in performance.

a system in UDK that would allow a live performer to “puppeteer” Audrey II as if she were a video game character, allowing her to interact in real time with actors.

4. Results and Conclusions

For the November 2012 production of *Best of Broadway*, Audrey II was performed for audiences six times: two dress rehearsals and four performances. Our talk will discuss the full production cycle, pipeline, and lessons learned about bringing game and animation technology to bear on live theatrical performance. We will discuss how the directing process reshaped the structure and design of the animation sets; and how the required precision of musical timing affected our interface design and control system. We will also discuss modifications made to both the UDK and the live performance that allowed us to use FaceFX, designed primarily for speech, for a sung performance. Finally, we will discuss using our current systems in conjunction with real-time motion capture and facial animation software to bring Audrey II or a similar character into a full-length performance.

References

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