

# The Duran Duran Project: The Augmented Reality Toolkit in Live Performance

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## Extended Abstract

A variety of real time visual effects were developed for the band Duran Duran's December 2000 "Pop Trash" live concert tour. The AR toolkit [1] was utilized extensively to prototype and demonstrate many of these effect sequences.

A real time 3D visual effects system was assembled consisting of a Windows 2000 based desktop PC, a Winnov Videum capture card, and professional grade video cameras. Using software based on the Microsoft Vision SDK and OpenGL libraries, the system captured live video of the band or the audience and composited it with real time 3D graphic imagery. The results were projected onto a large screen where the audience could view the results. Simple animations were pre-programmed and triggered based on the lead singer's requests during the concert. This process enabled animated characters to appear live with the band on a large projection screen. The system created an augmented reality effect that convincingly mixed 3D graphics with the audience's real world view of the band.

Prior to the tour we intended to utilize AR toolkit based tracking during the live shows. The band members expressed interest in having the ability to appear to pick up animated characters and interact directly with them on stage. In rehearsals, under tightly controlled lighting conditions, this approach worked well. Ultimately, we did not utilize the tracking fiducials during the live shows due to random lighting conditions that made it difficult to achieve consistent results. However, we found that the AR toolkit was extremely useful for pre-programming 3D position locations throughout the stage environment. Before a concert, AR toolkit fiducials were used to set and record 3D coordinates where animated characters and objects would appear in the show. These saved positions were loaded during the live performance. Throughout the actual concert, animations were keyboard triggered to appear at these pre-programmed stage locations.

This project illustrates both the versatility and the practical limitations of using the AR toolkit in a live

performance. As a result of our experience, we found that the AR toolkit integrates easily with professional broadcast video equipment. The AR toolkit functioned seamlessly in a complex system of video switchers, broadcast cameras, recording decks, and large format projectors. Furthermore, we found that chroma and luminance keying techniques can significantly improve the live video quality of AR toolkit applications. We hope that our experience will encourage other developers to explore using the AR toolkit in live performance scenarios.



Figure 1. Animated character triggered by a fiducial

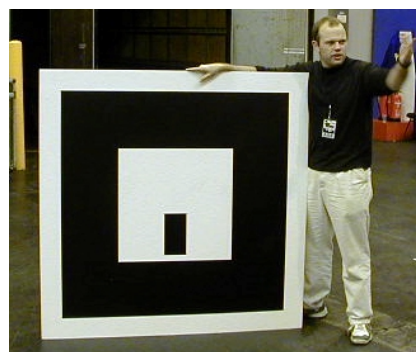


Figure 2. Large fiducial used to pre-program 3D stage coordinates before a live concert performance

## References

- [1] AR Toolkit  
[http://www.hitl.washington.edu/research/shared\\_space/](http://www.hitl.washington.edu/research/shared_space/)