

# BÜHNENTECHNISCHE RUNDSCHAU



(c) Jill Steinberg

## A new, radical approach for the Opera of Monaco

*David Staples*

Imagine (if you can) an opera where the leading man hardly appears on stage but his breathing and gestures drive the scenery, the chorus is a bunch of robots, the debate about amplification of opera is ignored with the entire opera being amplified and the set is a pixel display that breathes in time to the singer. Such an opera premiered last month in Monaco. Such an opera can be put together if you have the talents of innumerable PhD's from the Media Lab at the Massachusetts Institute of Technology. It also helps to have royal patronage – from Prince Albert II of Monaco and financial assistance from Association Futurum.

Some will view this opera as a vision of the future while others will decry it's radical innovation sad think it blasphemous.

The presiding genius is Tod Machover, Professor of Music and Media at the Media Lab. He is also director of their Opera of the Future group and has been described by the Los Angeles Times as "America's most wired composer". Machover has created a number of operas incorporating new technologies, Valis premiered at the Pompidou Centre in Paris in 1987. The Brain Opera premiered at New York's Lincoln Center Festival and his most recent opera Skelig is based on a very successful children's novel and adventure story.

But Death and the Powers takes his explorations further than anything he, or probably anyone else has attempted in the world of opera. To understand the technologies and the artistic goals it is necessary to briefly explain the plot. Simon Powers is an aging billionaire from the computer industry – think Bill Gates or Steve Jobs in a few years' time or Howard Hughes from the past. Powers wants to defy death by being subsumed into the System – a massive IT system. Powers downloads himself into everything in his environment – walls, chandelier, lighting, etc. He will live beyond his death within the system and be able to communicate and influence through the system.

Powers family and colleagues have to learn how to interact with and sustain a relationship with the disembodied Powers. This leads to an erotic encounter between Evvy, his wife, and Powers as personified by the chandelier. Powers also invites them all to cheat death and join him in the System

Having established this premise, Powers enters the system and disappears from the stage. He performs the majority

of the opera from an offstage location. But he is not simply singing. He is controlling many of the elements on stage. The term "Disembodied Performance" has been coined to describe this system and much of it was developed by Media Lab researcher Peter Torpey. The system allows an off-stage actor or singer to give a performance on stage in a completely non-anthropomorphic form. The system uses a variety of sensors to gather data about the performer's gestures, voice, and actions in order to infer a model of the character's affective and cognitive state, distilling the character's essence at any given moment. His arm and hand gestures, voice, breath, posture and stance are all combined with other inputs, processed and transmitted to a number of set elements and other components that use light, projection, movement, and sound to recreate the performance on stage. The picture shows artist James Maddalena wearing some of the sensors.

So what does the Disembodied Performance System actually control on the stage. The Greek term *periaktōi* is often used to describe towers used for rapidly changing scenery. They were first pioneered in the theatre by Nicola Sabbatini (1574 – 1654). *Death and the Powers* updates the concept by embodying modern technology in three traditional triangular *periaktōi*. Their positions on stage are monitored by a Ubisense location system and each tower incorporates *Versatubes* to create a huge pixel display. The display can present colours, movement or video. The image is formed and influenced by the movements and gestures of Simon Powers, combined with sound and other inputs – the visual appearance and set for every performance will be different. The three towers can combine to create a display with a resolution of 173 by 69 pixels. The image shows the control system for the walls below a graphic representation of what is being shown on screen. The images are a synthesis of video compositing, generative and live imagery.

Now to the robots. *Death and the Powers* has a live cast of seven, a live orchestra of 15 musicians and a chorus of eleven Operabots who all take a curtain call at the end of the evening.

There are nine full sized Operabots and two smaller "puppy" bots. The Operabots are autonomous devices controlled by simple Playstation 3 controllers as found on computer games. Each Operabot can move freely around the stage and can grow from 140cm tall to over 2metres. Each has an onboard computer. The Media Lab and MIT could draw upon almost any computer company in the world to provide huge computing resources. Instead they choose to use the world's simplest and cheapest laptop computer, the OLPC or one laptop per child. Founded by Nicholas Negroponte, the former head of the Media Lab the mission of OLPC is to create and distribute laptops for a target price of \$ 100. To date over 1.5 million laptops have been distributed. The picture shows the green laptop exposed in the base of the Operabot.

Most opera directors and conductors have experienced problems with chorus members not doing what they are instructed. The same problem arises with Operabots who have been known to ignore their controllers and move around the stage in an unpredictable fashion.

There is a regular debate in opera about the use of amplification. Opera enthusiast and purists decry and condemn the use of amplification and allege it corrupts the pure form. But those same critics take for granted to the use of electricity to light the performance. Much amplification of opera and classical music has been badly executed in the past giving a very poor acoustic experience. But the Media Lab researchers have harnessed computing power and new thinking in sound to create a high, quality sound field. Two main elements are the creation of an ambisonic environment and the use of a Wave Front – an array of small loudspeakers on the stage edge. The concept of ambisonics as a high resolution surround sound system was first suggested in the early seventies. But technology at that time did not allow the goal to be achieved. Ambisonics goes beyond the two channels of stereo or the five of 5.1 systems to create an ambisonic signal which can be processed and distributed to a large number of speakers throughout the auditorium. In Monte Carlo some 143 speakers were used to create full surround sound with height "periphony". Coupled with the wave front speakers this allows precise aural positioning of a singer in space.

But, does all this technology produce a good opera or is it simply an academic exercise to test the bounds of computing power? *Death and the Powers* succeeds at both. Strip away the robots, disembodied performance, lights, sound, etc and you have a very acceptable 90 minute opera with an interesting plot, well performed by the customary musicians and singers. But this opera also explores a series of new technologies that stretch the boundaries of opera and performance. Some of these technologies will find their way into our opera houses and theatres in the next ten years. Others, such as Operabots may not be seen again.

More information is available at the *Death and the Powers* web site at [opera.media.mit.edu/projects/d...](http://opera.media.mit.edu/projects/d...)

Peter Torpey wrote his PHD thesis on *Disembodied Performance* Torpey, Peter A. *Disembodied Performance: Abstraction of Representation in Live Theater*. S.M. Thesis: Massachusetts Institute of Technology, Media Arts and Sciences, 2009.

*Death and the Powers* can be seen in March 2011 in Boston and April 2011 in Chicago.