

General Articles and Notes and Historical and Theoretical Perspectives - Theoretical Perspective Article

## Technological Advances and Virtual Opera Production

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<sup>1</sup> James Wilson, *The Adagio Flow Machine Overview*, <[www.dantetheopera.com/overview/](http://www.dantetheopera.com/overview/)>

## Abstract

The aesthetic depth in this new genre, virtual opera, facilitates the use of musical and visual techniques often excluded from a traditional opera production. For example, the use of computer animation has truly opened up a new direction for musical theater, one that was previously the sole province of film and television producers. Given the influence of cinema on twentieth and twenty-first century viewers, these influences can only help to draw and maintain audiences for new offerings growing out of the musical form traditionally known as "opera". It is an influential, entertaining, and emotionally rich form of art that needs and deserves to regain its prominence in our culture.

In my new virtual opera production *The Avatar*<sup>2</sup> (available for viewing on YouTube - a link is provided in footnote #2) I used two advanced software technologies - the use of a sophisticated video editing software package, "Vegas Pro", and a Digital Audio Workstation software package, called "Cubase Pro 11", is used for computer assisted composition and sound production. This paper presents the argument for the continued support and growth of this exciting new genre and for the use of readily available computer technology in the service of operatic music production.

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<sup>2</sup> James R. Wilson, *The Avatar Virtual Opera*, <[www.youtube.com/watch?v=GmE4O2q\\_sSI](http://www.youtube.com/watch?v=GmE4O2q_sSI)>, published on 2 August 2021.

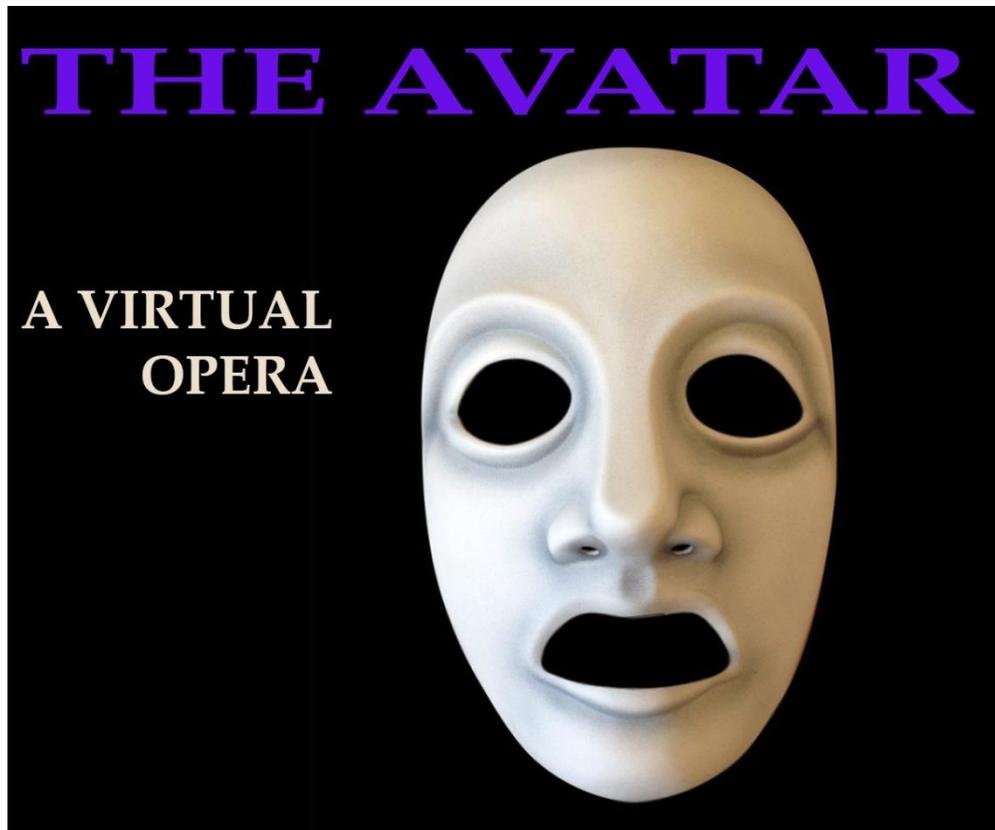


Figure 1 - "The Avatar" Virtual Opera available for viewing on YouTube

## The Case for Virtual Opera

Virtual Performance, created as a necessary response to the COVID pandemic, has opened up a number of new approaches to artistic and musical performance. These new "art forms" are still in their infancy, and will likely go through a number of transformations over the next decade or two. This paper presents the argument for the continued support and growth of these exciting new genres, and in particular virtual opera, and for the use of readily available computer technology in the service of operatic music production.

## History of Music with the Visual

MTV was born in 1981 and was heralded with great fanfare and eventual success as the "sight and sound" channel. That, along with the continuing and growing trend of using music in a supporting role in cinema, began what I consider to be the beginning of the end of music as a standalone art form. Music has become increasingly secondary, playing a secondary role in today's world of entertainment and the arts. Very few people listen to music today unless it is also accompanied by some form of visual media.

Opera has always been an art form that presents a balanced combination of both the visual and the audio. In fact, if anything, although staging was important, the music and the operatic singers were typically the main draw and focus of attention in any given performance. Music was at least equal, if not the dominant force, in an operatic production.

For better or worse, the pandemic has given birth to a new operatic art form - the virtual opera. Although we can never replace the beauty, grace, and social aspects of traditional opera, the virtual opera brings forth additional opportunity. Virtual opera is not reliant on a brick-and-mortar presence, thus it is free of the confines and expense of a geographic location. Virtual opera is available to anyone with an internet connection and a little free time on his or her hands. Virtual opera becomes available to all, regardless of the size of their wallet and/or their location, remote or otherwise.

In general, opera has been experiencing a decrease in interest and support over the past few decades. Primarily, this is likely due to expensive tickets and the overall inconvenience of getting

to and from the presenting theater. Have you ever tried to get to the Disney Center in downtown Los Angeles on a busy day? You literally are taking your life into your own hands!

In a recent conference presentation *Opera beyond Itself: Installing the Operatic, Experiments in Opera Today*<sup>3</sup>, discusses recent trends in operatic performance, and suggests several qualifiers to define “what is opera?”:

- Opera is no longer confined to brick-and-mortar venues, and now occurs in such diverse locations as train stations, bars, restaurants, museums, and, more recently, multi-media internet sites. It is no longer institutionalized in the traditional “Opera House”. She references an installation authored by Berthold Schneider and Veronika Witte (2001, 2005), *Opera for a Small Room* by Janet Cardiff and George Bures Miller (2005).
- Contemporary opera might now be defined as having the attributes of artifice, exaggeration, and motion. Ms. Novak emphasizes “artifice” as the primary attribute, as the use of language in conjunction with the operatic voice avoids any notion of “realism”. This is particularly important in virtual opera, as noted below by composer JR Wilson who states that the words used in his virtual operas are just random vowels and syllables, and have no real meaning. Most traditional opera is performed using the original language, such as Italian or German, and is rarely understood when performed in English speaking countries. That being the case, is it really that much of a leap to forgo the use of meaningful language in the libretto?

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<sup>3</sup> Jelena Novak, “*Opera beyond Itself: Installing the Operatic, Experiments in Opera Today*”, Heyman Center for the Humanities, Columbia University, 20 April 2018, <[www.academia.edu/video/jYvK71?email\\_video\\_card=watch-video&pls=RVP](http://www.academia.edu/video/jYvK71?email_video_card=watch-video&pls=RVP)>

## The New Genre of Virtual Opera

The aesthetic depth in this new genre, virtual opera, facilitates the use of musical and visual techniques often excluded from a traditional opera production. For example, the use of computer animation has truly opened up a new direction for musical theater, one that was previously the sole province of film and television producers. Given the influence of cinema on twentieth and twenty-first century viewers, these influences can only help to draw and maintain audiences for new offerings growing out of the musical form traditionally known as "opera". It is an influential, entertaining, and emotionally rich form of art and needs to regain its prominence in our culture.

## Use of Technology in the Creation and Production of Virtual Opera

The use of technology in music is well documented. A recent article published by the Southern Utah University, in an article entitled *The Impact of Technology on the Music Industry*<sup>4</sup>, describes this technology revolution in music as follows:

The digital era has been tough on the music industry, but it has also opened the door for emerging artists who might otherwise never have gotten the exposure they deserve. This democratization and proliferation of music through technology is a boon for music lovers, as is the opportunity to watch a performer live online from thousands of miles away. Advancements in music technology have spurred growth and innovation in music creation, which is, after all, the point of art.

While the digital music revolution inarguably hurt music industry giants in terms of sales, it also leveled the playing field between big music businesses and smaller ones like indie record labels. Advancements in home recording software allow musicians to record at low cost. Digital distribution platforms also let artists and small labels sidestep larger industry-controlled distribution channels.

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<sup>4</sup>*The Impact of Technology on the Music Industry*, Southern Utah University, 2 February 2021, <[www.online.suu.edu/degrees/business/master-music-technology/studio-game-audio/tech-impact-music-industry/](http://www.online.suu.edu/degrees/business/master-music-technology/studio-game-audio/tech-impact-music-industry/)>

Social media and video streaming services enable artists to connect with fans directly, reducing the need for expensive PR campaigns. In general, the digital era has led to a democratization of the music industry, improving opportunities for artists and professionals of many types.

Innovative music technologies are also integral to the creation of a lot of modern music. Software-based virtual instruments and MIDI technology allow people to use millions of sounds in the production of their music, which musicians can program and manipulate in complex ways. This offers a great deal of creative potential to the tech-savvy composer or producer.

## Audio Technology Used in *The Avatar* Virtual Opera Production

The use of technology in the production of opera is no different. In my virtual opera production, *The Avatar* (see footnote 1), I used two advanced software technologies - the use of a sophisticated video editing software package, *Vegas Pro*, and a Digital Audio Workstation software package, called *Cubase Pro* (Fig. 2). *Cubase Pro* is used for computer assisted composition and sound production.

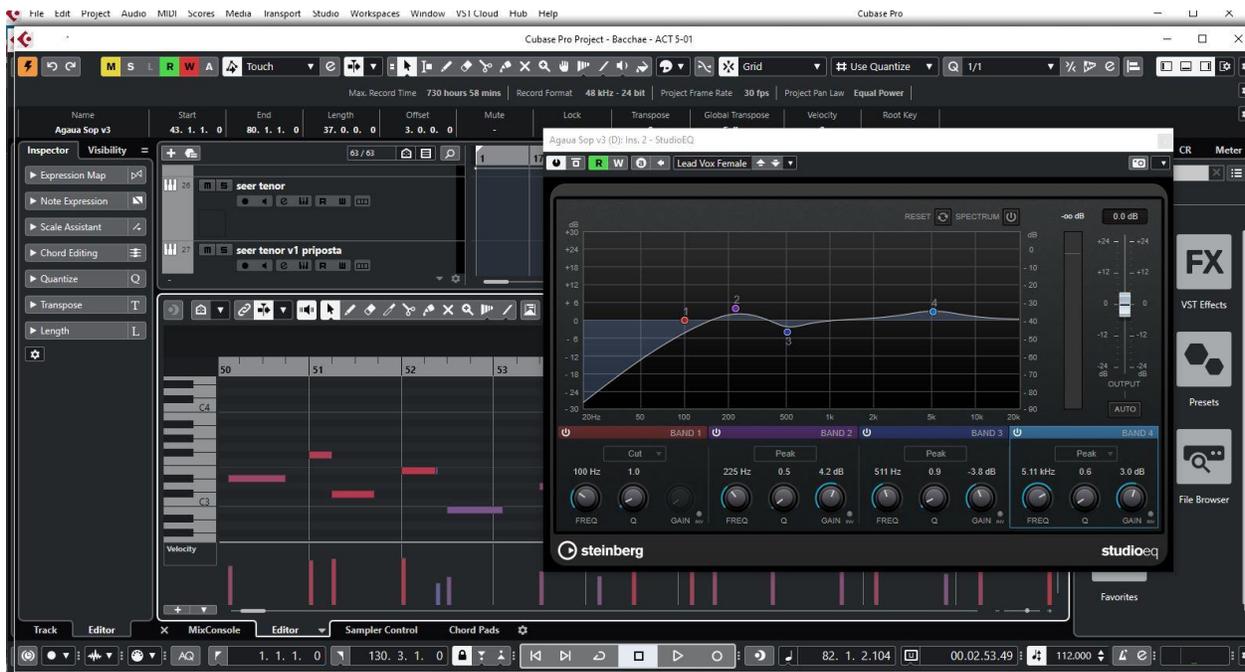


Figure 2 - screenshot from Cubase Pro DAW program.

In *The Avatar* production, even the vocals (i.e. opera singers - Fig. 3) are computer generated using VST instruments.



Figure 3 - A scene from Act 6 - the vocal parts are computer generated.

*VST: Virtual Studio Technology (VST) is an audio plug-in software interface that integrates software synthesizers and effects units into digital audio workstations. VST and similar technologies use digital signal processing to simulate traditional recording studio hardware in software. Thousands of plugins exist, both commercial and freeware, and many audio applications support VST under license from its creator, Steinberg. - Wikipedia*

In my experience, using a VST vocal instrument in opera has its challenges. Most vocal VST instruments aren't capable of singing real words; the technology just isn't there (yet). Lip-synching to a visual of the singer, for example, becomes very difficult. However, using a vocal VST also offers many advantages: I have full control of the sound environment, and intonation and a perfect execution of the vocal score becomes a reality. High overhead obstacles, like multi-rehearsals, are no longer needed, and the time required to achieve a finished production is greatly reduced.

## Video Technology Used in *The Avatar* Virtual Opera Production

The *Vegas Pro* (Fig. 4) software package was used to produce all the visual content seen in the virtual opera. Vegas features real-time multi-track video and audio editing on unlimited tracks, resolution-independent video sequencing, complex effects and compositing tools, 24-bit/192 kHz audio support, VST and DirectX plug-in effect support, and Dolby Digital surround sound mixing.

I took video clips from various thematically and periodically correct films and compiled them in such a way as to linearly simulate the storyline of the opera's dramatic origins - a play written by the Greek tragedian Euripides, *The Bacchae*.

I used a number of video effects available as part of the video editing package, including video overlays, coloring effects, slow motion, and focus and panning effects.

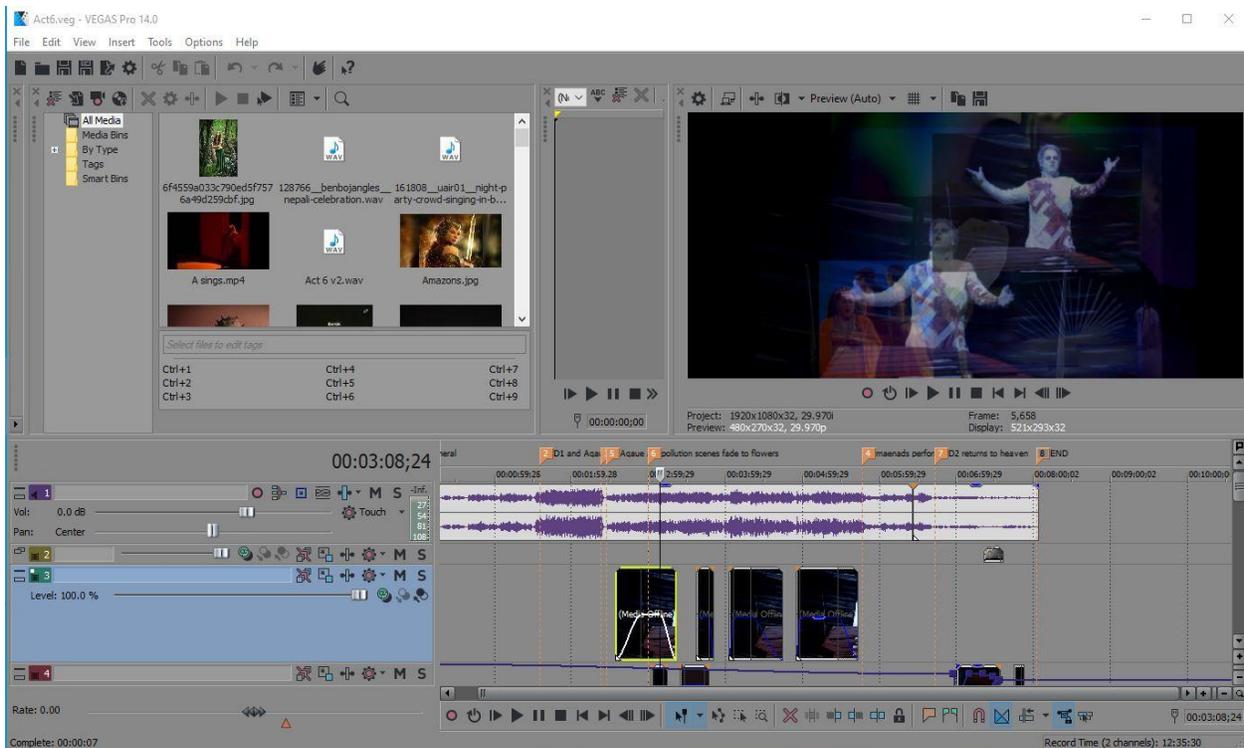


Figure 4 - A screenshot of the Vegas Pro video editing program.

## Conclusion

In spite of these obvious advantages, I would prefer the use of live operatic singers in future productions, providing sufficient funding is available. I would continue to use my current techniques for the majority of the visual content, but would include videos of the live performers instead of representations, and would continue to use VST instruments for the orchestral score realization and for other sound effects. Chorus parts would continue to use VST instruments in the same manner as is heard in *The Avatar*. In order to integrate live performers into my virtual opera production methodology, I would implement the following process:

- Procure the services of real operatic vocalists singing real words (i.e., the libretto). Live performances would be reserved for operatic soloists only, typically 2 to 4 individuals.
- Singers would go to a local professional recording studio to record their parts.
- Sound engineers would coordinate with each other to get their sound/recording environment as identical as possible (i.e., room ambience, mics used, etc.). Any sound processing effects would be added later during the post-production compilation process.
- Singers would be provided with costumes to wear to the recording studio, appropriate to the theme of the opera.
- Videographer(s) would join the singer at the studio, and video record the singer singing his/her part and play-acting in front of a green screen. The videographer would capture visual content only. The sound is captured in the recording studio by the studio's sound engineers.

In general, I would much prefer this approach to virtual opera production given that the necessary resources are available.



Figure 5 - the author's studio with Digital Audio Workstation (DAW) technology and related hardware components

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