Figure 1. Joseph Merrick, 1889

Figure 2. Håkan Starkenberg performing as Merrick, 2012

Figure 3. Developing The Throat III

The Throat III - Disforming Operatic Voices Through a Novel Interactive Instrument

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Abstract

Practitioner-led artistic research, combined with interactive technologies, opens up new and unexplored design spaces. Here we focus on the creation of a tool for opera-singers to dynamically disform, change and accompany their voices. In an opera composed by one of the authors, the title-role singer needed to be able to alter his voice to express hawking, coughing, snuffling and other disturbing vocal qualities associated with the lead role – Joseph Merrick, aka "The Elephant Man". In our designerly exploration, we were guided by artistic experiences from the opera tradition and affordances of the technology at hand. The resulting instrument, *The Throat III,* is a singer-operated artefact that embodies and extends particular notions of operatic singing techniques while at the same time creating accompaniment. It therefore becomes an emancipatory tool, putting a spotlight on some of the power hierarchies between singers, composers, conductors, and stage directors in the operatic world.

Keywords

Artistic research; operatic practice; autobiographical design; interactive instrument.

ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

Introduction

The professional opera-singer must master a wide range of technical skills to be able to perform in the context of large orchestras, big audiences and huge concert venues. Development of new operas typically takes place within this framework, which means that even new operas normally require classical vocal technique. The development of *The Throat III* questions this prerequisite, offering an extension to the classic operatic form, but still acting within the boundaries of what we recognise as opera. The short production times and the demands for efficiency – a direct result of the large sums involved in producing opera – has created a thoroughly hierarchic world, where the singer (even the "diva" of a production) is expected to sing what is predetermined and no more, residing at the bottom of the hierarchies of creativity. With *The Throat III* an additional means of artistic creativity is introduced, giving the singer extended expressivity and control of the vocal impact of the performance.

Related work

The urge to renew the operatic form with current technology, can be traced all the way back to the roots of operatic art. Opera was in its earliest form in the 16th century merging the newly rediscovered antique drama with current musical instruments, musical styles, vocal virtuosity and philosophy. Throughout the centuries, composers such as Monteverdi, Mozart, Wagner, Berlioz and Stockhausen has incorporated technological novelties and musical innovations in their operas. In our digital times, this heritage means incorporating interactive and electronic means in the art form. Important work on interactivity has been done by Robert Lepage and Tod Machover et al. [2] among others. However, none of the prior work, to our knowledge, has aimed at both extending the singer´s expression-range within the vocal paradigm, and at the same time empowering them to take control over musical and dramaturgical components in the performance.

Background

The operatic industry calls for singers with "clear", "loud" and "beautiful" voices. This is accomplished by training students in the vocal technique often referred to as *Bel Canto*. The professional opera singer has acquired loudness, a homogenous sound in all registers, stamina and overtone projection as well as the capacity of integrating singing with acting and drama. This training normally takes around ten years of study before a singer is ready to perform the main parts in classical operas like Carmen, Bohème, or Rigoletto. In 2009, the first author was commissioned to compose an opera based on the life of Joseph Carey Merrick, aka the Elephant Man (Figure 1). However, the annals tell us that Merrick hardly could speak. How then could a whole opera - wherein the main artistic expression implicitly is a Bel Canto-trained voice - be conceived upon him and his life? This was not only an artistic and technological concern, but also an ethical one. Frederick Treves reports of his patient in his autobiography:

"I supposed that Merrick was imbecile and had been imbecile from birth. The fact that his face was incapable of expression, that his speech was a mere spluttering and his attitude that of one whose mind was void of all emotions and concerns gave grounds for this belief. The conviction was no doubt encouraged by the hope

Figure 6: The NorrlandsOperan version of the sensor mounting.

Figure 7: The NorrlandsOperan version of the radio transmitter mount.

that his intellect was the blank I imagined it to be. That he could appreciate his position was unthinkable." [5]

Joseph Merrick developed a severe physical disability, rapidly increasing during his short life, which made his head, lips, legs, right arm and hand grow out of proportion and made his contemporaries deem him as an imbecile. If the singer could embody the disformity by evoking changes in his own voice through the movement of his technologically augmented right arm and hand, aesthetic and artistic qualities would possibly converge into a work of art. A participatory development (see Figure 4) process started, based on former work, The Throat I and The Throat II [1]. The new version of the interactive and singer-operated artefact would need to be able to appropriate the disformity in the voice using the movements of the artist's hand as well as adding disformed sounds that would have destroyed the singer´s voice if performed live.

The novel instrument The Throat III

The Throat III consists of three cordless sensors, one cordless microphone, a sender-receiver pair for sensor-data and a computer running sound software. One flex-sensor on the wrist, and two push-sensors (index finger and middle finger) will – through gestures and combinations of these sensors – forward chords, implement changes in the sound-processing, and even change complete setups (called scenes). [1]

Autobiographical and participatory design

The design process behind Throat III is partly *autobiographical* [4], and partly *participatory* [3]. In an auto-biographical design process, the designers use themselves as both designers and users, establishing *"intensive self-usage as part of the design research"* enabling

the developer to *"build(-ing) a system from the start that really works"* [4]. Participatory design is characterized by the inclusion of multiple stakeholders in the various stages of design, which in the operatic field means commissioners (in this case NorrlandsOperan, Umeå, Sweden), performers, composers and designers as well as reviewers and audiences. As part of the design process, one of the authors (as seen in Figure 5) performed with The Throat III in the interactive dance-work *Artificial Body Voices* [6]. The designerly exploration was many-sided: while performing the vocal parts the author was also operating the interactive hand and thus testing it in front of the audience. This called for a thorough exploration of the possible weaknesses of *The Throat III*, improving the technology step by step until it became a natural and stable part of the singing expression. One essential demand on performances that are presented for a paying audience is that the presentation *works* – be it the singers' voices, the dancers' movements – or be it the artefacts used on stage. All these different components have to merge into one whole aesthetic expression where the different parts together create for the emotional experience. Each component must provide a stable functionality. In this phase hardware issues and errors in graphical interface as well as in the sound processing code were rectified continuously.

The Throat III in the Elephant Man opera

The Elephant Man opera [7] starts with a pre-show where the audience experiences the featured "freak" of the evening – who shows off his hand and voice to his audience (as seen in Figure 8), This enabled the audience to not only see and experience the technology used, but at the same time grasp the opera's main theme: the antagonist conception of the good-natured

Figure 8: Pre-Show. "The freak showing off his hand/ voice to the audience"

Figure 9: From scene 3 act I: "There´s a Beast let loose on London town tonight"

interior and the monstrous exterior. In this opening scene, The Elephant Man is hidden behind a veil, and the audience hears his disformed voice while it sees the shadow of the hand modulating the voice. The singer creates his own accompaniment based on qualities and tones in his voice, and at the same time provokes the audience with monstrous and highly disturbing sounds such as the sound of mucus and coughing. During the production at NorrlandsOperan, a new mounting of the sensors as well as a holster for the radio-transmitters were constructed (see Figures 6 and 7).

In this opera, it was of key importance to enable the artist performing the title role to operate his own voice inside the large operatic machine of singers, orchestra and stage machinery. Only then could he create an artist-operated disformed vocal expression that helped both audience and creators to a deepened understanding of some of the severe sides of human conditions and existence. In Figure 9 we see the Elephant Man as an outcast of society – a "beast let loose on London Town". In a radio-interview on the opening night with title-role singer Håkan Starkenberg (as seen performing in Figure 2), he says:

"It is incredibly interesting research that you have to do to get this sound, and it is also an interesting link between the perfectionism we strive for as opera singers versus the voices of those who have this kind of disability. Carl Unander-Scharin met two young people who have severe disabilities that affect their way of talking and sounding. How they struggle to communicate and make themselves understood! [...] I have to rely on my education and my opera-voice, while using that as a base to create a distorted voice both with my own

technique and understanding, as well as with the instrument The Throat III.[1]

The Elephant Man opera has been performed 12 times in Sweden and has been broadcast by Swedish Radio. The reactions to this novel 'voice' is perhaps best described by this quote describing the lead singer, Starkenberg, as: *"He is not only inhibited by his voluminous costume but also by an electronic voice aid that the composer has invented. [..] It creates for a creaky machinelike tone on Starkenberg's voice: annoying at the start, then more and more fascinating".* [3]

References

[1]   Elblaus, L., Hansen, K.F., and Unander-Scharin, C. Exploring the design space: Prototyping "The Throat v3" for the elephant man opera. *SMC11* (2011).

[2]   Jessop, E., Torpey, P.A., and Bloomberg, B. Music and Technology in Death and the Powers. *New Interfaces for Musical Expression*, (2011), 349–354.

[3]   Schuler, D. and Namioka, A. Participatory design: Principles and practices. *CRC*, (1993).

[4]   Sengers, P. Autobiographical design. *CHI 2006 Workshop on Theory and Method for Experience-Centred Design*, (2006).

[5]   Treves, F. The elephant man and other reminiscences. *BiblioLife*, (2009).

[6]   Unander-Scharin, C. and Unander-Scharin, Å. Artificial Body Voices. Interactive Dancework*, SVT* (2011).

[7]   Unander-Scharin, C. and Williams, M. The Elephant Man - The terrible tale of The Elephant Man and Jack The Ripper, two freaks of nature. Opera in two acts, *NorrlandsOperan/ Electronic Opera Publ.* (2009-2012)

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[1] Interview by Märet Öman, Swedish Radio, October 2012.

[3] Review by Bo Lövfendahl, SvD, October 2012.