Sensory Accessibility Headset

Project Proposal

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Overview

Lighting, sound, and projection designers are frequently asked to alter production designs in order to accommodate audiences with sensory issues (such as Autism Spectrum Disorder), presenting these productions as "sensory-friendly" presentations of the main show. A July 29 Playbill.com article discussing the expansion of sensory-friendly performances of several Broadway hit productions including *Harry Potter and the Cursed Child* demonstrates the need for more accessibility in this area. We are proposing giving the audience the ability to individually control their experience at *any* performance of their choosing.

This product would be a combination of current lens and headset technology, as well as possible augmented reality technology, which would enable an audience member to do several things over the course of a production:

- Control their experience of the production's sound design (by lowering the volume/intensity)
- Dim bright lights as needed
- Filter out specific wavelengths, such as blue/green, so that fluorescent or other colors that were irritating might be mediated
- Block out certain overwhelming projection content

Current noise cancelling headphones such as Bose Quiet Comfort Wireless and the Sony 1000X Wireless allow for the wearer to experience sound at adjustable levels. Additionally, there are technologies for lenses that allow for dimming as well as possible filtering of specific colors. Some of these are used by members of the autistic community, while others are still being developed. We would want to research SKUGGA sunglasses, Theraspecs, and others to see if they can be used in this application. And, of course, the big question is whether these could be integrated into augmented reality headsets.

The end goal of this product would be to allow any audience member the ability to control the intensity of their own experience of a performance while still being able to attend any performance – not just the specified "sensory-friendly" one. It will enable anyone on the autism spectrum to mediate their own experience according to their needs, but will also include those not on the spectrum who have sensory sensitivity. Additionally, it could meet the accessibility needs of other communities: for example ,it could be useful to audience members needing hearing assistance. Future iterations could also be modified to include surtitles, or to introduce other informational or artistic content.

Industry Impact

1. Make performance more accessible to audiences by allowing them to attend any performance of their choosing.
2. Allow for greater inclusivity of patrons with different needs.

3. Provides new opportunities for artists and designers to engage with the audience and with the art form.

Milestones/Tiers

We are proposing this project as three "tiers." Each tier accomplishes a different objective of the product. Our proposed budget reflects each tier individually and we intend to work on one tier and make it work before moving on to the next; once we have Tier 1 and Tier 2 working, we will be working to combine the two before moving on to Tier 3. This allows for the option of partial funding of the project. Indicated time frames are approximations; start times will likely vary, and some tiers may take less time to complete than others.

I. Tier 1: Headphones / Sound (September - November 2020)

Preliminary research suggests that sound is the primary concern among users affected by sensory issues. Many use noise canceling headphones but these are problematic in performance settings as actors can be too quiet. Being able to control what sound is allowed in could help an audience member experience both the quiet actor as well as the louder musical sections of a show.

II. Tier 2: Lenses / Light (December 2020 - February 2021)

Many people with sensory issues are affected by either intensities of light, wavelengths/colors (such as the blue/green of fluorescent lights), or flashing lights like strobes. We will be researching lens and glass technology that can adjust these for the wearer.

III. Interim Phase (March - May 2021)

Once we have these two tiers working for an audience member during performance, the next step would be to combine into a single working prototype. This would involve designing a new integrated physical headset and a single interface for control of light and sound.

IV. Tier 3: Augmented reality / Projections (June - August 2021)

With tier 3, we would be looking at current augmented reality technologies to see if they can solve other problems experienced by people with sensory overload issues. Are there problems audience members have with specific projections? Are there other visual issues we have not explored? This tier would require a sizeable amount of research and labor but would also possibly create a product that could be used across the industry for multiple purposes (surtitle projections, AR scenery, etc).

Resources & Questions (Knowns, Unknowns)

KNOWN KNOWNS

Opera Hack participants
Connections with Baylor,
UT Austin, Austin Lyric
Opera, Florida State, Mixed
Blood Theatre

KNOWN UNKNOWNS

Partners in tech/non profits
Users to work with
Places to centralize
production & testing
Engineering
Cost of tech
Labor & cost of that labor

UNKNOWN KNOWNS

Creative partnerships
Nonprofit partnerships
Other collaborators

UNKNOWN UNKNOWNS

Unknown technology
Costs
What happens when this is
scaled up

We are considering approaching Baylor and UT Austin about this project because there are research centers for autism at Baylor University and UT Austin has an entertainment technology program that might be interested in assisting with engineering and providing facilities. Sarah Mosher teaches at Baylor and Megan Reilly frequently spends time in Austin. Austin Lyric Opera might also be a good partner for testing prototypes. Given that the team is scattered across the country, we believe identifying a place where we can centralize research and development while still working remotely when necessary is ideal.

There are many things we do not know and could use other collaborators on this project, particularly in engineering. We would also want to reach out to the Autism Theatre Initiative and involve plenty of people who would be the target users. We are planning on utilizing some of our labor hours as research time as we figure out the "unknown unknowns" in this project and approach the collaborators we need.

Budget

Please see attached budget sheet for a breakdown by tier.

Sensory Accessibility Headset Budget

Budget Revised 10.30.2019

	BUDGET	ACTUAL	UNDER/OVER
TIERS 1 & 2	$ 14,000.00	$ -	$ 14,000.00
TIERS 1 & 2 PLUS INTERIM	$ 26,000.00	$ -	$ 26,000.00
ALL TIERS 1, 2 & 3 PLUS INTERIM	$ 52,000.00	$ -	$ 52,000.00

TASK	LABOR HRS	RATE	MATERIALS UNITS	$/UNIT	FIXED COST	BUDGET	ACTUAL	UNDER/OVER
TIER 1								
Headphones - Bose Quiet Comfort Wireless			2	$ 350.00		$ 700.00		$ (700.00)
Sony 1000X Wireless			2	$ 350.00		$ 700.00		$ (700.00)
Labor	40	$ 50.00				$ 2,000.00		$ (2,000.00)
Contingency (parts, tech, etc)			1	$ 600.00		$ 600.00		$ (600.00)
						$ -		$ -
						$ 4,000.00	$ -	
TIER 2								
SKUGGA sunglasses			2	$ 1,000.00		$ 2,000.00		$ (2,000.00)
Theraspecs/custom made version			2	$ 1,000.00		$ 2,000.00		$ (2,000.00)
Labor	100	$ 50.00				$ 5,000.00		$ (5,000.00)
Contingency (parts, tech, etc)			1	$ 1,000.00		$ 1,000.00		$ (1,000.00)
						$ -		$ -
						$ 10,000.00	$ -	
TOTAL (TIERS 1 & 2 PLUS)						$ 14,000.00	$ -	
INTERIM PHASE								
Labor	200	$ 50.00				$ 10,000.00		$ (10,000.00)
Contingency (parts, tech, etc)			1	$ 2,000.00		$ 2,000.00		$ (2,000.00)
						$ -		$ -
						$ -		$ -
						$ -		$ -
						$ 12,000.00	$ -	
TOTAL (TIERS 1 & 2 PLUS INTERIM PHASE)						$ 26,000.00	$ -	
TIER 3								
Augmented reality headset			1	$ 3,500.00		$ 3,500.00		$ (3,500.00)
Bose Audio Sunglasses			1	$ 200.00		$ 200.00		$ (200.00)
Labor	400	$ 50.00				$ 20,000.00		$ (20,000.00)
Contingency (parts, tech, etc)			1	$ 2,300.00		$ 2,300.00		$ (2,300.00)
						$ -		$ -
						$ 26,000.00	$ -	
TOTAL (ALL TIERS)						$ 52,000.00	$ -	