For Locus Sonus I propose a new research-creation project that explores the potential of **affective computing as a strategy for driving responsive VR environments**. Resonating with Locus Sonus' vision for *New Auditoriums*, this research project will explore **responsive algorithms that generate unique auditory/narrative experiences for each VR viewer in a fictional world where space itself responds to emotion. The experience is personalized through the use of biodata devices that monitor skin conductance, heart rate, and respiration data to gauge emotional response.** The goal is to create a virtual world that attempts to "learn" from physiological/emotional reaction of the participant and **induce** physiological feedback through combinations of (1) pre-recorded binaural spoken word as well as (2) generated sonifications of the physiological data of the audience/listener. The results of our explorations will be monitored both through qualitative as well as quantitative means through integration of an SD card that the hardware writes to during the media sessions (this would be a new hardware component added to my already existing biodata system).

BIOSENSORS FOR PHYSIOLOGICAL MARKERS OF EMOTION

I have been designing and using custom, open-source biosensors for many years in my artistic practice, and have realized several projects using these technologies, including *Swarming Emotional Pianos* 2015 (a system of robotic chimes that is driven by physiological sensations of professional method actors moving through extreme emotions), *BioSynth* (ongoing) (a hardware-only synthesizer system driven by physiological markers of emotion I've used in children's choir and audience participation models), and *Project H.E.A.R.T*. (2017) (A VR experience that combines first-person shooter conventions with a holographic pop star activated by player enthusiasm). I performed a great deal of programming on *Project H.E.A.R.T.* so am already familiar with programming in Unity. I would use this residency as an opportunity to (1) explore the relationship between affect and (virtual) space through quantitative (data) as well as qualitative (interview) measures (2) explore the sonification of biodata in Unity VR. The proposal to explore emotion, affect and space through experimental technologies in biosensing and virtual reality would open up new creative avenues for myself as I continue to explore human voices in electronic bodies, as well as what it means to communicate. I would be excited to use new technologies in collaboration with others in order to accomplish these goals during the Locus Sonus residency.

During the residency I would be happy to work independently, however am also interested in points of exchange between practitioners and myself on-site. I could transmit my knowledge on affective computing and emotionally responsive technological systems (including my custom hardware system for biosensing, the BioSynth) as well as principles for emotionally responsive design in art (I taught a workshop at Aarhus University in Denmark in 2017 on this topic). I would enjoy working with programmers experienced in generative sounds in Unity for this exchange, or researchers interested in sonic spaces and virtual architectures to play with the expansion and contraction of space in sound as well as image. I'm particularly interested in sound, emotion and space as elements that are not only perceived through combinations of physiological and psychological input, but also can have a mutually constructive relationship on one another.

DESCRIPTION OF VR EXPERIENCE

The VR world would feature an abstracted voice as a guide the VR participant – During the residency I would perform this voice and record her using binaural recording techniques, giving the impression she was already in front of or inside the head of the VR participant. The voice would provide gently whispered cues to provide intimate, uncanny, and sometimes subversive whispered content—both describing and extending what the viewer sees in psychological ways. The voice creates a link between the viewer and the "material-virtual" world.

Example script:

(whispered) Look around you: keep looking. Yes, it seems that you see the bowl of rice. You will see the bowl of rice and then you will not. (when raycast moves away from rice, object disappears). Right now I need you to focus your eyes on this light…(move a particle from side to side, sonify physiological responses. Voice begins making inaudible noises, note if skin conductance rises in response to mouth sounds)… Forget everything, you don't need to forget that you are also sitting in a chair right now, in an air-conditioned room that has no rice within it, anywhere. Yes I'm talking about your real world, but there is also my world that wants to talk to you. We need to focus on what is really here, now, there isn't much time but we have a lot of work to do, many systematic perception tests I am monitoring and everything will be explained after this treatment but first: we will perform a simple attention-loss test. (sounds of pen on paper, monitor skin conductance for responses) Feel your consciousness being focused in the centre of your forehead, and don't be afraid to feel (snap) feel (snap) feel (snap) a bit heavier in your seat, feel your legs and core against these surfaces but also forget them (mouth clucks+tapping …sonify physiological responses to emphasize heart beat if it rises)

(bowl of rice appears) I love the touch of small grains of rice on my fingers. (rice sounds) It's very clean and (sounds of inhale) has a fragrant smell. Breathe it in too, can you imagine this smell of sweet, soft tinkles? (monitor respiration) This rice has a secret in these small senses, we have already noted your reactions to our stimuli and are moving on to the next test. (extended rice sounds impacted by physiological responses), hear these little voices, they respond to your body?…try to summon your will together while listening intently, it will change your relationship to this room (wait for skin conductance rise) Note that the subject has successfully changed their skin conductance in response to verbal cues. (sounds of notepad) Very soon you are going to depend on objects to tell you the truth about your world. We are here to train you to these spaces and objects, you can come back anytime you like to continue your treatment and I can't explain this to you in any other way but this, it's clearer here now. Let me take some notes on your process (sounds of written pen on paper…inaudible commentary)…

[move through 2 or 3 other objects, invite VR participant to attempt slowing their heartbeat, reduce their blood flow, induce skin conductance rises, sonic feedback], moving walls or opening up spaces with body…

These shifts of rhythm in your body can explain a lot about how objects communicate. What we perceive through our senses is a small segment of other kinds of senses that our world contains. It is our hope that maybe soon you will hear whispers of objects when you **take off** the VR helmet, long after our treatment is complete. Take a moment and touch the table now….yes the table in your physical world…feel it's grain on your fingertips….(VR sounds fade out entirely) what do you hear… and feel? (sonifications of emotional data….) Are there people in the room with you, do you feel their breath, sense their heartbeats? (sounds of two people breathing in virtual space, camera POV will start to levitate in virtual space if subject breathing becomes deeper and breath per minute slows)

The objects are very sympathetic to your body and their own rhythms speed up and slow down, these material relationships bind us all together. Your world is deeply in need of material empathy and compassion right now as the earth becomes closer to global collapse. We are trying to accelerate these processes through technology but you are well aware that this is an experiment and the extreme nature of these processes are necessary in order to escape the obvious measures that are clearly not working fast enough. Still this is not an easy or immediate process. Your heart rate has slowed by ## percent since this process has begun, and your ability to control your skin conductance is (weak/developing/impressive).

In this project I propose virtual space and spoken word as a means of creating a "speculative" materialism that promotes empathy to (virtual) objects by allowing the viewer to objectify and analyze their own (biodata), making material of the human body itself. I'm interested in exploring the limits of virtual physicality and phenomenological experience through imaginative sonic narrative as well as virtual space, making use of simple 3D objects and architectures dramatically lit, referenced imaginatively through the five senses by the unseen narrative voice in order to maintain the focus on sound: the disconnect between virtual material and sonic suggestion forms a useful perceptual noise (for example, the voice writes on a notepad that is never seen, the sounds of a lab or examination room can fade in and out, lab is never seen). During this residency I would record the spoken word sections inspired by roleplay, personal attention and spoken narrative vocalizations typical to the genre of Autonomous Sensory Meridian Response (ASMR), a style of sound composition developed largely on the internet that focuses on high frequency noises to create intense feelings of relaxation accompanied by "tingles" felt on the skin. ASMR enthusiasts focus intensely on the physiological reaction of the listener to sound, and so I want to use this voice as a means of loosely describing material agencies of virtual objects as imperative to the expansion of human sensorium. The link between physiological and phenomenological experience and confirmed biofeedback pushes the physical potential of VR into new sonic territories that focus on embodied experience through perceptions of external as well as internal spaces.