An Excursion into Electro-acoustic Music History

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ICMC 2021 was successfully held online from July 25th to 31st. It was hosted by the Pontificia Universidad Católica de Chile, Santiago, Chile. The inaugural concert on the 25th opened the festival, and all six pieces were electroacoustic: a fixed-medium piece *Spectral Variations* by José Vicente Asuar, interactive electronic and video piece *The Metered Tide* by Chris Chafe, an improvisation *Another Time* by Chris Chafe and the Quarantine Session Performers, *After Long Drought* for vibraphone and live interactive electro-acoustics by Elainie Lillios and Scott Deal, and *Kontrol* for performer and electronics, and visual music *Tesseract* by João Pedro Oliveira. This concert was a perfect interpretation of the conference theme "the virtuoso computer: redefining limits". It highlighted the role of the computer and of virtuosity in computer music. The relationship between computer and composer/performer is always a matter of concern in electronic music. With the fixed media, interactive computer music, and visual music works presented on this concert, it clearly outlined the features of different stages of electronic music from an historical perspective. Virtuoso refers to the skills and interpretation of the music performer in the performance. In computer music, it also means the composers utilize and personalize the endless possibilities provided by computer. This concert, a sampling of computer music from different periods, was an excursion into electro-acoustic music history. It is a highlight of various genres and techniques and provided the audience with a sense of the evolution of computer music. This review also focuses on the musical aspects of these pieces from an ontology perspective.

In the 1950s, with Pierre Schaeffer and Pierre Henry in Paris, Stockhausen in Cologne, Vladimir Ussachevsky, Otto Luening, Milton Babbitt, Charles Wuorinen at the Columbia-Princeton Electronic Music Center in New York, and Toshiro Mayuzumi in Tokyo, the classical studios were established and in their golden time. These composers were the giants in electronic music history. However, José Vicente Asuar's Spectral Variations (Variaciones es-

pectrales) on the program reminds us that there were so many other talented composers from various parts of the world who were studying, composing, and contributing to the electronic music field at about the same time. They added their cultural background into music, brought the concept and technique of electronic music back to their country, and helped to disseminate electronic music virtually everywhere. Spectral Variations shows how the music was wonderfully conceived and delicately created. The first piece of this concert features one of the most well-known works of Asuar, who is one of the founding fathers of Chilean electroacoustic and computer music, and the inspiration behind the conference's theme. He was regarded as the pioneer of Chilean electronic music at the national level and the first electronic music composer of the Latin America. This concert was also a tribute to this founding fathers of Chilean electronic music.

Spectral Variations was composed in 1957. It is musically consistent. The four movements are based on the interval-based motive at the very beginning. The motive fully develops with rhythmic patterns, repetitions and arpeggiations though-out the movements; especially the voices in high, middle and low registers work together in terms of repetition and crescendo, finally leading the music to the climax in the fourth movement. This last part is a blend of all materials and enhances the motive. José Vicente Asuar uses sine wave, square, impulses and white noise in four variations: Acordal, Linear, Evocativa and Obsesiva. The consistency is also reflected in the texture and timbre of the four movements. The melodic voices in the high, middle and low register create dialogues between each other. The clear structure of the form reminds on the influence and foundation the composer absorbed from the western composition techniques. This piece is a sound experiment within musical structure. Even though it is an electronic music piece, it involves traditional means including polyphony, ostinato, repetition, and the importance of intervals.

The Metered Tide composed by American Composer Chris Chafe and videographer Greg Neimeyer is a composition for visuals, electronic

cello and electronic music. This work touches one important aspect of electronic music, namely improvisation. The composition includes three kinds of sound materials: concrete sounds (sea waves, surrounding sounds), the electronic cello (celletto) improvisation, and an sound element with an electronic synthesizer timbre generated from one hundred years of tidal data records which serves as the base of the structure. While listening to the concrete sounds, the live performer Chris Chafe is able to react with his cello play in real-time to the generated sound and improvise; the consistency of his performance perfectly shows his improvisation virtuosity. The sound materials hereby closely intertwine with each other. The wide register range between celletto and the electronic sounds are distinct, which makes the two voices to some degree independent. I would take this contrast as two different roles within the music.

The video is filmed in the Crissy Field, Golden Gate National Recreation Area at the upper tip of San Francisco next to the southern end of the Golden Gate Bridge, which is the visual background of the performance. The visuals include three elements which are the waveform interacting with the sound signal, the shore and sea waves, and Chris Chafe as performer playing electronic cello. In the final section of this piece, the performer put down his instrument and walks away from the center of the image, leaving only the sound and image of sea waves until it ends with a black screen. This kind of performance management is quite narrative and it is also a significant character of concert performance. It provides the audience with a more immersive impression, just like the experience in a concert hall. The waveform centered in the image vividly responds to the title of the piece. It could be regarded as a new dimension to meter the sound and the visual. The visual center includes the waveform and the performer. Even though the visual scenes change frequently, the images are quite effective to enhance the dramatic tension of the music, especially, as the sound and images are closely synchronized which allows the musical climax to build up with the fast-changing images.

Chris Chafe, the Director of Stanford University's Center for Computer Research in Music and Acoustics

CCRMA has been devoted to electronic music improvisation for many years. In this concert, Chafe improvised with Quarantine Session Performers to offer a tribute to all musicians and composers who have endeavored to spread music during the COVID-19 period. All the sound materials were collected from the online performances and talks from March 2020 to July 2021, thus creating a retrospective of this special period. Chris Chafe and Scott Deal are the main passionate supporters in this field. The format of online sessions also comes with some extra benefits, such as helping to reduce CO2 emissions, and providing the possibility for people to join the event to share ideas and music without traveling.

After Long Drought (2016) for vibraphone and live, interactive electroacoustics is composed by Elainie Lillios and performed by percussionist /composer Scott Deal. Lillios was inspired by Wally Swist's poem with the same title. It is one of my favorite pieces and it was included on the concert I curated on the Design Day Marathon Festival in October 2021. The collaboration between composer and musician is always a subject in electroacoustic music performance. In this case, they both have encountered each other's composing and performing from 2011. The collaboration between musician, composer, and methodology involved in creating a piece together not only relies on virtuosity and techniques in western composition and computer music, but also the common understanding of musical structure and the shared aesthetics. Scott Deal has put his energy into exploring the diverse sounds from the prepared percussion instruments which give inspiration to the composer. He performs every section with one specific technique or timbre to enhance the timbral diversity in the structure. In the progress of writing this piece, Elainie also left some space for Scott to improvise with the electronics which contributes to his unique aesthetics and experiences with the instruments. The intense rhythmic beginning with thunder and rain sounds creates an atmosphere directly and vividly outlining the scenery of the desert in wind and storm. Each section of this piece is presented with a certain timbre and instrumental technique to draw a scene of different parts of the windy desert and re-

flect the metaphor of the unpredictability and tumult of life. The music ends after a steady rain-storm and fades into a peaceful moment.

Kontrol is a virtual percussion piece for one performer and electronics. João Pedro Oliveira introduced this piece as: "Movements correspond to sounds and sounds correspond to invisible instruments", that explicitly shows the mapping of sound and actions. Even though the percussionist is not sending any sensory information to the electronic music modules, the seamless mapping of his action to the sound contours makes it convincing and interactive. The sound contours and transformations are clearly recognizable in his performance. They even enhance the emotion and tension in the musical journey. In the coda section, the music suddenly changes from abstract granular and metallic timbre to a typical drum sets. It looks like the composer was demystifying where the abstract sounds came from. This unexpected design reveals Oliveira's mature virtuosity in communicating by way of his sounds and music.

João Pedro Oliveira's *Tesseract* (2017) was the last piece of the concert. The interaction and mapping of this visual music is quite delicate. The hypercube transforms into multiple states and textures via transforming, rotating, decomposing, reconstructing, erosion, twisting, and changing the lighting and textures. The synchronization of sound and image is seamless, which is a typical characteristic of algorithm-based art and music composition. The visuals are created by the composer as well, a workflow which guarantees the unity of sound and visuals. The video starts showing a huge cube on the canvas, which then splits into many small-scale hypercubes in different sizes. While the visual elements go through decomposition, rotation, reorganization, erosion, distortion, color and light perception by changing the texture and color temperature of the image, the sound texture also changes its timbre in a similar manner to the visuals. The image is transformed from a cube with edges and corners to lava-like images with animal feather-like texture, plane images with mirror texture, micro-cube arrays with three-dimensional depth, plane images with paper sheet-like texture, and liquid dynamic images.

At the same time, the particle-like visual elements continue to swim around the screen. The elegant granular and bright clean metallic sounds highlight the music exquisitely.

This concert presented examples from the development of electro-acoustic music spanning from the early studio piece in the 1950s, mixed electroacoustic music with instruments, interactive music performance and improvisation, to algorithm-based audiovisual music. We have seen the development and the virtuosity of the technology and the aesthetics changing the music paradigm. This concert opened ICMC 2021 successfully, highlighting especially a tribute to Chilean composers and their contribution to the community.