

The word "TEMPO!" is written in a large, yellow, serif font with a black outline. It is positioned on a musical staff with five lines. Several black musical notes are scattered across the staff, some above and some below the lines. The background is a textured, orange-brown color.

TEMPO!

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IN THIS ISSUE

ARTICLES:

Elementary Technology and Storytime

Social/Emotional Learning and Equity

Technology for Live Connectivity

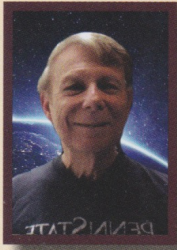
NJMEA Tech Expo and Young Composers

All-State Band and Orchestra Requirements

Region/State Jazz Requirements

Crescendo Foundation

The Official Magazine of the New Jersey Music Educators Association
a federated state association of National Association for Music Education



Exciting New Music Technology for Live Connectivity and Performance

Dr. Fred Kersten
Lecturer, Boston University
fredkers[at]fredkersten.com
<https://www.bu.edu/cfa/profile/fred-kersten/>

Prelude

Imagine conducting your band rehearsal from your bedroom on Saturday morning with all your students performing from their homes in almost instantaneous response. No more laborious hours in front of the computer tweaking sent on individual files from performers who have recorded from a pilot file you sent on to develop a virtual ensemble for viewing by the community and parents. Or, a jam session from members of your jazz ensemble, performing together from their homes as a Sunday afternoon live concert for any one to attend from your school district. The audience will come to the performers! Check out an example at: <https://elk.audio/remote-jamming-over-internet/>

New technology, that provides opportunity for instantaneous communication with others over distance is here, and, it will provide so many opportunities for musical interactions between students. Teachers can immediately teach lessons from afar as they play examples for their students to model. Interaction lessons, where multiple students can play as quartets or ensembles, will be a possibility. Cloud-based “live” orchestras can be created over distance. Artists can develop concerts and perform from their home studios. They can sell tickets and the audience can “visit them” for their concerts.

What is the technology that will allow this? How immediate is the possibility for its inclusion? What will be needed for its outreach to participants? This article will answer these questions and provide an illustration of the advantages of its inclusion, as it becomes a viable tool for music teachers.

5G for Music Education

It is Here!

Live 5G networks are starting to proliferate in the United States at an increasing rate. These opportunities will allow for the transfer of data at an increased speed; with increased bandwidth for Internet purposes. Lower levels of latency between senders and receivers will be possible. With a send/receive lag of approximately 3 milliseconds performers can play together in a natural manner. The past virtual ensemble techniques utilized during COVID included laborious hours of recording musical examples and audio editing voluminous files to sync and provide a composite composition. Such activity will not be further needed. Once connectivity has been established, the performers can rehearse, woodshed, talk, sing, and teach as if they were in the same room. Playing as an ensemble will not be a problem. Intonation can be immediately adjusted to compensate if one player is sharp or flat. Nuances of interpretation, and variances of tempo, by other players can become a source of flexibility for interpretation of the composition. A higher level of musicality will result thus banishing the woodenness of recent virtual ensemble conglomerate performances.

How Does 5G Work and What is its Status?

Simplistically, 5G transfers come from the “Cloud” and the data transmits from numerous “cells” that blanket the receiver’s locale. Because there are more cells for each area, the speed of 5G data is incrementally higher than the current venue of 4G. Each 5G cell, however,

covers a smaller area, which can limit the access by the receiver, or, provide “pockets” where data may not be received. 5G possibilities are increased as providers are networked to provide for increased connectivity over a larger area.

Ericsson Technology

Ericsson 5G technology (<https://www.ericsson.com/en/blog/2019/3/real-time-music-collaboration-with-5g>) suppliers are increasingly involved in delivering opportunities for musical communication. Their created linkage is providing systems that have developed into a highly connected network. Predominantly based over seas, this network is now supporting a real-time totally online Internet orchestra that is conducted by Joana Carneiro, principal conductor for Orquesta Sinfonica Portuguesa. Joana is from Portugal and has conducted some of the world's most acclaimed orchestras in a career stretching back more than twenty years. Joanna, (2021) indicates in WEBNEWS, “never before has she conducted without being able to make direct eye-to-eye contact with all her musicians. That is until 5G came along!” (<https://www.ericsson.com/en/news/2021/5/ericsson-and-vodaone-power-5g-orchestra>) Besides the opportunity for large ensemble interaction, there is much promise for international collaboration between not only large ensembles but chamber groups and vocal/operatic performances as well.

Aloha-ElkLIVE

Aloha (now ElkLIVE) (<https://elk.live>) has been in beta stage development for many years. This company has just now joined the commercial ranks and is now available for public utilization. Employing a hardware-based system, ElkLIVE is able to provide a low-latency opportunity for live musical performance that can be utilized over a respectable distance. Recently, because of COVID restrictions, the San Francisco Opera Company has been using ElkLIVE to rehearse for upcoming performances. An example video of their rehearsal may be accessed at: <https://www.youtube.com/watch?v=s32qs3-52a0&t=4s> This video illustrates the immense possibility for music practice with individuals located over many miles distant from each other. Additional examples of possible live performance interaction may be located at:

<https://www.youtube.com/watch?v=5gsaFP4dNv8> and <https://www.youtube.com/watch?v=lnFd9bvEKHM>

Coda

The New Horizon for Instant Musical Communication

Employing new technology opportunities such as 5G and ElkLIVE will provide an incredible possibility for instant connectivity between musicians, audiences, and musical performances. Hardware, and “Cloud” highways of increased efficiency, are currently under development and will assist in building opportunities for instant musical collaboration. Working with these tools, the musical data highway will become a new opportunity for extensive individual and group musical interaction.

Imagine the possibility of: A US 12-year-old piano student playing duets with his/her artist teacher in France. A high school girls' trio rehearsing together from their bedrooms. Two high school bands, from different districts, practicing together weeks earlier than their scheduled festival and playing in sync as they work on tempos and interpretation. So many awesome possibilities for constructive music education interaction!

Feedback Requested

What are your thoughts?? The author of this article would welcome your response. What experiences have you had with live interactive performance? What opportunities do you see for improvement of music education in the future through its usage?

Contact: Dr. Fred Kersten [fredkers\[at\]fredkersten.com](mailto:fredkers[at]fredkersten.com)
<http://fredkersten.com> <https://www.bu.edu/cfa/profile/fred-kersten/>

Reference

NEWS, MAY 04, 2021. Ericsson 5G and Vodafone Portugal ensure Joana Carneiro's orchestra doesn't miss a beat. (Accessed 7/30/21). Retrieved from <https://www.ericsson.com/en/news/2021/5/ericsson-and-vodaone-power-5g-orchestra>