A CASE FOR INNOVATION IN JAZZ THROUGH INTEGRATION OF THE DIGITAL/MOVING IMAGE

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ABSTRACT

The incorporation of screens in our daily life is slowly impacting and reshaping our jazz listening experiences. Are new methods to engage with the digital image and 'jazz' performance more relevant now than ever before? How are composers and performers of jazz able to be agencies of intentional works that embrace this extra dimension of multi-media?

The possibilities of digital and moving image within many other contemporary art practices are well known (Rugg et. al., 2007, Sukla, 2001). This paper will consider the impact of utilizing video and images as a vehicle for innovation within jazz performances. It will begin by briefly positioning jazz within the multi-media and music performance paradigm, and also investigate any past and present 'jazz' works that have embraced this as an integrated conceptual focus. Attention will then turn to the technical manner in which this may be achieved - by observing the performance environment, aesthetics and current technology associated with artists like Edit Bunker. The paper will then move to document my own first attempts at constructing a performing and improvising environment and creative works primarily via Ableton Live 9 and Resolume Avenue 6 software.

I argue that by augmenting conventional performance modes of jazz with additional meanings via video or image – we prime the creative and experimental spectrum of jazz with new possibilities for impact in the 21st century. Further, that this could contribute to wider notions of jazz (including a wider and more diverse range of participants) will be explored, as well as possible implications; such as genre blurring, inter-textuality and multi-disciplinary outcomes and approaches.

1. INTRODUCTION

Engagement with this research area emerged out of a desire and need for a technical up-skill in order to augment electronic and acoustic performances of jazz with digital images and video. This paper is essentially the beginnings of a literature review and discussion on the aesthetics of digital/moving image within 'jazz' performance, and asks if engagement or innovation in the area is relevant or needed. Whilst hard to define, 'jazz' as I refer to will mean performed or recorded original music and projects which are of the current time period - usually featured in jazz clubs today or recent record releases - and also projects that are placed more towards the progressive, experimental side of that spectrum. This location of jazz is commonly referred to elsewhere as 'modern jazz' or 'contemporary jazz'.

2. LOCATING JAZZ WITHIN A BATTLE FOR USER ATTENTION

The incorporation of screens in our daily life is slowly impacting and reshaping our jazz listening experiences, and perception of jazz artists and culture. Several leading New York City jazz clubs are streaming sets of music for free, and also have subscription services available for extra content. The technology and software has grown speedily around streaming, where any type of live performance can be filmed from multiple angles, using various wired and wireless cameras. Angles can be automated, changed on-the-fly and audio sources can be mixed and balanced effectively (for example, using the software and hardware Livestream, soon to be part of the Vimeo brand). Further, these advances in technology are also integrating online ticketing, the traditional 'merch' store and selling of performance content (Gigee, Ustream, Tourpedo software et. al.). These opportunities exist for venues but also for artists - as a diverse range of products and pricings exist. As Chinen remarks, "Jazz has always been best served in performance, so it makes sense that as capacities have expanded, live streaming has become a tool of outreach." (Chinen, 2013). Such developments are beginning to drive new questions and conversation around general live music attendance, consumption - and remuneration for jazz musicians in the future via their performances.

Further, the agents, clubs and bodies that promote jazz (and jazz artists themselves) are using the smaller, yet very effective tools found within our screens (the changing platforms of the day such as FaceTime, Skype, Facebook Live or Snapchat) towards building audiences, and generating online profiles and branding. Whilst these platforms include more opportunity for some, and positive contributions to jazz and arts culture and audience building - they are not immune to social media saturation either. If Facebook, (the top social network) can

experience a quantifiable overload (Fullerton, 2016), with numbers indicating that users can reach a content saturation point (becoming more immune to ads and exhibiting shorter attention spans for user videos), no doubt advertisers and their chosen social platforms (and probably many jazz artists) will continue to evolve and transform to the next, in an attempt to contact and keep connected with the consumer in the great ongoing battle for user attention.

Although the rise of jazz music and related promotional video content online has probably resulted in a fatiguing for it generally in that setting, jazz and screens are also sporadically being harnessed toward positive innovations for live 'jazz' performance and composition via groups such as Tin Men and the Telephone and Edit Bunker. The multimedia and even social media convergence with music has already been consciously explored and achieved in many improvising art and music genres, while less so in jazz. Within 'New Music' spheres there are many examples of composers, ensembles and associated scenes that embrace improvisation (both free and restricted) also with excellent innovation and integration of digital and moving image. There are also instances of music becoming increasing interactive in varied genres.[1]

3. RESPONDING TO OUR TECHNOLOGICAL TIMES

If the possibilities of digital and moving image within many other contemporary art practices are well known (Rugg et. al., 2007, Sukla, 2001), it may be tempting to think that jazz needs to merely 'catch up' conceptually with these techniques. Yet jazz - musically plural and democratic by nature - is often trying to do different things or have different emphases and complexities (such as characteristics of 'groove', 'swing', idiosyncratic group interplay etc). It's most progressive figures have tended to be those who make responses to the social and political times, and the advancement of musical structures alone has not always been of paramount importance or relevance for inventive music making.

Today there are blurring of the lines. There are increasingly innovative concert-like projects embracing digital/moving image where terms like 'classical' and 'jazz' are breaking down - effectively leaving just a 'music' or 'multimedia' performance. I also observe other musicians searching for an expanded jazz aesthetic, incorporating a visual component that may be drawn upon to make an artistic response to our current social and technological times. I wish to argue for more of these explorations in ambitious-scale exploratory and modern jazz, but also on the smaller scale within the jazz club. These augmentations and innovations need not be at the expense of sound.

Yet jazz should be wary of playing with a new box just as a point of difference or for a new audience-building project. When speaking of the aesthetic innovations derived from increases in technology within the rise of MTV videos in the 80s and 90s, Phillip Hayward remarks upon a '…competitive nature of individual video's attention-seeking amidst a prolific field of production." (Hayward, 1990, p. 140). Many acts, audiences and clients became interested in the 'how' of video production (a type of 'technovelty'), and from this grew more and more spectacular effects and transitions. These were innovative in aesthetics, but didn't produce actual *new forms* of MTV videos.

Perhaps new forms of jazz are exactly what is needed – and it is fair to say jazz has always been fusing with other forms of music and styles. (Gridley, 2012). Some extremely postulate via online magazines that classical music and the concert hall (or read jazz club) is already dead (Vanhoenacker, 2014). Some (even more at the fringes) would argue that audiences have been sitting through this 2-dimensional version of jazz performance for many years now – and that a logical critique, extension, and reframing of the materials, modes and delivery of jazz as an art music - has been wanting for some time.

Young children growing up in Australia now are spending on average 2 hours on various screens each day (Yu & Baxter, 2015), although other studies from around the world seem to quote much higher figures, including the USA. Content and context of these increasing trends aside (including both positive and negative effects, and granting the fact that screens are progressively becoming a part of everyday life), our relationship, reliance on and interaction with screens is seemingly on the rise - and the ability of innovative jazz composers and performers to deal with that philosophically, and create a conversation with emerging generations remains relevant.

This may be tackled within performances and compositions that embrace the digital and moving image. It may also contribute to the wider discussion about our own generation's relationship with screens.

4. WHERE IS JAZZ AND MULTIMEDIA?

Jazz and improvised music artists who engage with digital/moving image concepts are not easily found, but they do exist. There are those Jazz musicians who have worked with visual artists (often for one-off events); of the like of Bill Frisell and cartoonist James McNew in

[1] Consider musician or media artists such as Chris Vik, Michel Banabila and Nicole Lizée. Perhaps more analogous to modern jazz, this can be exhibited through the evolution of the packaged pop concept 'album', now incorporating varying degrees of screen-based elements. For example the 2011 Bjork *Biophilia* 'album-app' blends music and learning of the natural world and technology through an interactive interface (to high critical acclaim).

2014 through *Offhand Gestures: An Evening of Spontaneous Creation* at the Town Hall in Seattle. Of interest also is *A Night of Spiritual Jazz* led by Rama Allen, ECD at The Mill in New York, featuring three generations of jazz artists: Kamasi Washington, Pharoah Sanders and the Sun Ra Arkestra for the Red Bull Music Academy Festival. There are also projects akin to Performance Art, involving various jazz and cross over artists such as Matana Roberts (*Coin Coin*).

There are several ventures where digital/moving image is a minor part of the conceptual integration, and within this category I place such examples as the *Serbian Jazz Brel Project* with live VJ artist Ivan Grlic, and Peter Hofland's projects (b. 1951) including *At The Movies (jazz meets multimedia)* (2011). The Necks' performance at the 2016 Perth International Arts Festival consisted of a substantial performance with accompanying evolving/looping video for the whole 70 minute duration, and Alister Spence Trio's album *Fit* (2009), which also contained a DVD with film work (in the style of Super 8) from Lousie Curham would also fall into the category.

4.1. Works that have a Major digital/moving image conceptual integration.

The Australian Art Orchestra, due to its charter of '…exploring meeting points between cultures and disciplines' (AAO, 2018) are clear leaders in our region with regards to pioneering and cultivating this integrated conceptual focus. Nicole Lizée's recent new works for the group, including *8-Bit Urbex* (2016) creates a soundscape around the theme of representation of cities from video games in the 1980s (Kight, 2017). The video game moving image and its sound design are (seemingly) woven together to form the musical fabric together with live musicians. They are often in synchronization, not unlike the delivery of Edit Bunker. Eugene Ball and Peter Knight's exciting work *Struttin' with some Barbecue* (2014) contained film projections and set design by Sabina Maselli, and original portrait images by Linzee Arnold. Various other productions by the AAO have contained visual and video installation to varying degrees, including *The Theft of Sita* (2000).

Amsterdam based group Tin Men and the Telephone (Tony Roe – piano/visuals/electronics, Pat Cleaver – bass and Bobby Petrov – drums) have achieved a highly sophisticated, unique, creative and (often) playful approach to jazz performance; involving manipulations of a wide selection of video and audio content from which engaging jazz compositions and improvisations are made. The overarching aesthetic is also a highly synchronised multi-media experience of performed music with digital video/audio content. For instance, live performed pitches on their instruments may often 'double' the pitches produced within spoken word video samples (resulting in highly idiosyncratic musical compositions), or could be made to emphasise events within sports footage. These types of experimental techniques may be traced and located partly from the emergence of electro-acoustic music during the 20th Century.

The group's delivery is also innovative within jazz due to an emphasis on audience interaction, usually involving digital or moving image. To do this they have collaborated with sound and video artist Marcel Wierckx and Mark Marijnissen, who creates interactive experiences based on game design principles using app and internet technology. They have given a livestream concert from Ronnie Scott's in London, and also completed a project with the Metropole Orkest - both of which partly featured musical material sent by audience members from their devices via a specially developed app, whereby the band members would then proceed to improvise or work with the material and the indeterminate events they generate.

These musical projects outline some current notions of digital/moving image within jazz performance. I will now describe the group Edit Bunker, whose approach may be most attainable to existing jazz groups wishing to expand their performance with such elements.

5. EDIT BUNKER - PERFROMANCE ENVIRONMENT

Edit Bunker is an American duo comprised of Zach Danziger (drums) and Owen Biddle (electric bass), who also appear in their alternate outfit, Mister Barrington. They perform electronic, free-form, semi-improvised compositions mixed with a live visual component; consisting of video, audio, digital image and effects. The band's name is actually a play-on-words of 'Edith Bunker', a fictional character from the 1970s American sitcom *All in the Family;* and edited and effected scenes that feature her are part of the makeup of musical material that the band explores. Being a relatively new group, it is not surprising there is not a lot of peer-reviewed literature surrounding the band's history or techniques.

The video content consists of material they have filmed themselves, and found content from pop culture. They effectively juxtapose contrasting content together, such as their track *Too Much of Us,* where characters from the 1980s cartoon M.A.S.K. 'interact' and are layered with edits of Busta Rhymes' rap from his song *This is Serious*.

5.1. Elaborate MIDI architecture

Philosophically, Edit Bunker have remarked (during a 2013 TEDX talk) that computers are growing in live music performance exponentially, and further integration is inevitable. They eventually they wanted to explore the question 'what if it (computers) played along with us?' (TEDx, 2013). To that end, some of Danziger's other musical projects contain '…no loops, no backing tacks, click tracks or fixed grid of any kind.' (Firth, 2017).

A seminal Digital Audio Workstation (DAW) used by both members is Ableton Live, renowned for its unique 'session view' and clip triggering interface. Multiple laptops can be synchronized over a Wi-fi connection, and share transport controls such as Tempo. This allows for a high degree of integration and flexibility and control of musical material, and triggering of video material. In the realm of VJing, it should also be said that Abelton Live can communicate with dedicated lighting/video projection software, through the Open Sound Control (OSC) standard. Two leading applications for this purpose are VDMX and Resolume Avenue (both now incorporating native Ableton Live support for communication and synchronization between applications).

As a result, Danziger has constructed a 'hybrid electronic-acoustic drum rig', and uses Alesis MIDI triggers attached to his acoustic drum kit, which trigger audio clips and software synthesizer sounds, augmenting the natural sound of the drums. Through a specific Max for Live script, Danziger can also use this setup as a tool to perform real-time pre-defined song melodies, chords, arpeggios or improvise with a collection of pitches, not necessarily of the same sound source either, but from any audio clip or MIDI instrument. (Micallef, 2013).

The bass signal flow is comprised of signal from the electric bass then converted to MIDI, processed by a computer, and outputted to audio amps and speakers. In particular, iZotope's *Stutter Edit* (DJ effects) and *Trash* (a multiband distortion plug in) are widely used. (iZotope, 2013).

5.2. Playing off chords

In a video for Vick Firth in 2017, Danziger suggests (when playing with other musicians) to share MIDI data around members of the group. A case in point is when Biddle does not finger bass notes, but the drums that Danziger plays triggers bass pitches. Through MIDI pedals, Biddle is able to activate this mode, and also 'stomp' on pre-defined chords - from which the attacks of the drums can trigger a set of available pitches. The musical result is a simultaneous and effective translation of drum rhythms to bass notes – and Danziger often employs extremely fast rhythms and cross-rhythms to this effect. This technique I would term 'hybrid performance'. Biddle is also free to trigger effects on the bass signal. Similarly, a different example of MIDI data sharing sees the harmonic environment that Biddle selects (via foot pedals) is also able to tweak the pitches of the drum-triggered melodies to make them consistent with the current chord within the performance. Danziger often assigns chords to the floor tom, and notes from those chords in the stacked cymbals. Finally, these parts of a melody can then be used to trigger video clips, and so each note can have a corresponding visual characteristic (with its own audio also mixed in, auto-tuned to the current harmonic environment). (Danziger, 2013). He maps different shapes, colours and filters for the video component to different drums, uses videos in loopers incorporating randomness, and vocoding so video voices can produce chords.

6. DISCUSSION

6.1. A VJ approach to innovation

Edit Bunker, it is fair to say, is situated and falls between the gaps of jazz, electronica and VJing. It is at its core a multimedia performance. Within the myriad of small original jazz groups in cities all over the world, nearly all seem to draw from like genres such as electronica, pop and rock or cite them as influences. Potentially, there are many existing musical projects that may not need considerable alteration to benefit from a conceptual expansion in the form of digital/moving image. This intersection with VJing seems obvious, as "VJing is a type of performance that combines the visual possibilities of filmmaking with the improvisational pleasures of jazz" jazz" (Spinrad & Ulto, 2005). Yet as we have seen, the examples are actually rare.

Musically, some of Danziger's MIDI and software setups may even have a high transferability to interactive jazz club playing, because there are often no clicks, no grids or backing tracks. I liken this to playing an instantaneous 'audio-visual sampler'. And because jazz often approximates other styles of music - this too could potentially be turbocharged via simultaneous music samples and images working together live. The sampler - like film - can reference any music, anywhere on the planet. Edit Bunker as a model therefore also whets our appetite for live 'meta-music' (music made from other types of music), and gives music or jazz the chance to turn in, and comment on itself (perhaps akin to the way Berio looked at and discussed musics through his inter-textual piece *Sinfonia* in1968-9).

Edit Bunker is, in essence, an extension of type of live interactive music that Winkler speaks of: "Live interactive music contains an element of magic, since the computer music responds 'invisibly' to a performer. The drama is heightened when the roles of the computer and performer are clearly defined, and when the action of one has an observable impact on the actions of another, although an overly simplistic approach will quickly wear thin. On the other hand, complex responses that are more indirectly influenced by a performer may produce highly successful musical results, but without some observable connection the dramatic relationship will be lost to the audience." (Winkler, 1998, pp. 8-9).

There are many excellent tools ready-made for such aligned purposes. Perhaps a distinguishing factor of a VJ type of approach to jazz may be an inclination away from code/object orientated programming, and a preference instead toward experimentation with DAW channel

routing, varied applications, MIDI/OSC integration, VST effects and ready-made MAX patches. The gathering and fine-tuning of these can be of itself be time-intensive and technical, even if the excellent computer assisted musical environments produced may still be prone to issues of error and stability.

Consider our best jazz improvisers. There is scope within a VJ approach for them to be themselves, yet also be harnessed within musical environments that leverage their complex human subtleties and complex musical gestures (things computers can't yet replicate well on their own). As Bedworth and Simmonds say of their own crafting of musical material with technology: "Somewhere in this complex there exists the prior musical experience and knowledge of the musician, whose aspects are potentially machine encodable, and their repertoire of skills developed over time, many aspects of which may resist encoding into the machine." (Ascott, 2000, p. 120). This intrinsic, interactive link between the performer and their gestures has not been explored in great depth within conventional modern jazz performances either - and has the potential to augment, expand or compliment an existing idiosyncratic jazz improvising language.

Given our experimental big bands or jazz orchestras, it is completely possible to imagine more innovative works (such as those commissioned by the AAO) where image and music have been conceptually and even materially developed simultaneously. There may be many individual and personal methods that produce a related hybridity between them. This has the potential to firmly place more jazz performers/composers in the realm of interdisciplinary artist; one who not only uses digital/moving image within a piece, but who also has technical fluency with it as a complimentary part of their primary practice. Such experimental groups and pieces could later become influential on other spheres of music (akin to Sun Ra's Solar Arkestra influencing Rock and Indi-pop). This notion is supported by university institutions trending towards creating opportunity in this realm for their students (for example the Peabody Improvisation and Multimedia Ensemble, part of John Hopkins University in Baltimore, USA).

Indeed, if embracing interdisciplinary or multidisciplinary practices, one should consider the possibilities for embracing and manipulating narrative. Jazz composition and performance could, in the future, more overtly attempt storytelling techniques analogous to filmmaking. Associated visual components could be included at the dramatic or subtle level, and exhibit shifting and disorientating timelines.

7. CREATING A BASIC PERFROMANCE ENVIRONMENT

Via routing and mappings of available software (Ableton Live 9, Resolume 6, MIDI Merlin 2, Trigg.me and Parameter Forwarder), I have created a primary performance environment for use in one of my jazz projects that incorporates sources of video and audio blended with live electronic or acoustic instruments. This approach both expanded existing musical compositions and served as stimuli for new ones. As I do not work in the fields of visual art nor multimedia, for this first venture I incorporated found, archival and personal home video content.

To work effectively, smoothly and dynamically within Resolume, rendering content to the DVX codec is necessary. Trimming and splicing of content occurred within Adobe Premiere Pro CC and rendering to DVX via Squared 5's MPEG Streamclip. The LINK function within both Ableton and Resolume was also necessary.

7.1. Concepts, signal flow, triggering content

Within my composition *Home Movie Memes* I was able to create a rubato introduction by assigning specific composed melody notes to MIDI messages. These audio (trumpet) pitches are mapped within Resolume to trigger short video clips. To do this I incorporated a microphone splitter (one signal to my computer, the other to the front of house PA). The playback length of each video is unique, adjusted within the Resolume Transport Playheads for each individual clip. Once a clip is triggered, other specific melody notes are then used to generate and control the playback direction of the video, and the performer can improvise within this framework, providing atmospheric visuals and music. To achieve this, I set about finding a reliable audio to MIDI converter, and settled on MIDI Merlin 2 (assembled by Randy George in MAX). Although not available as a VST for use within Ableton Live, it can still route there - however I only needed it to route directly to Resolume; via the Apple IAC (out) and MIDI Merlin 2 (into Resolume) driver buses. During live performances, I can now involve the frontline instrumentalist with this idea. The player can use (for instance) a Bluetooth QWERTY keyboard or MIDI command to engage or suspend Merlin (accessing the mapped shortcuts for audio and tracking on/off), and the dry audio signal need not be duplicated further. The following figure shows these applications working together, triggering video content:

Figure 1: Audio to MIDI, triggering video content.

The main portion of this tune is based around a simple recurring structure incorporating a crotchet melody that is displaced by a 5/16 bar. These long tones subsequently sound through each position of the semiquaver subdivision. When performed, pulsing video content remains synchronized to the shifting positions of the melody through each subdivision:

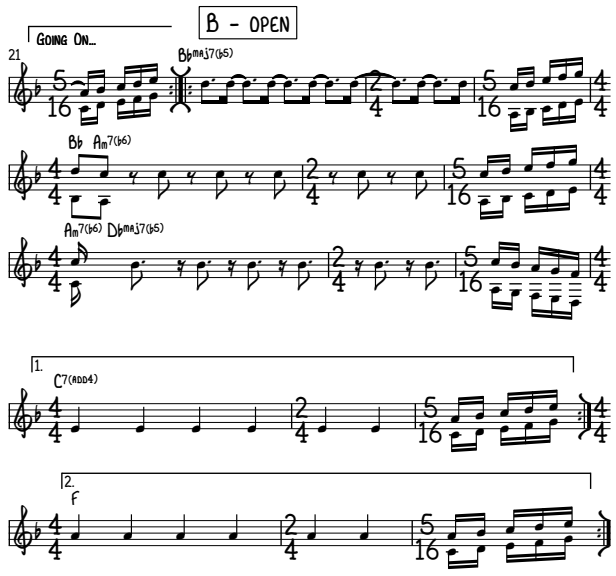


Figure 2: Beat structure for *Home Movie Memes.*

In reality these long tones remain aligned with the usual crotchet clicks within Ableton and Resolume. At the end of each cycle, the melody tones and software clicks align, but for performance a separate audible MIDI click was made to reflect the notated music for accuracy. In Resolume, the Random Playback function was used on each clip, BPM Synced to the internal crotchet pulse, along with a Shaper object on another layer to give a clear sense of strobing or pulsing.

I was able to adjust the metronome speed (by tapping the tempo into Ableton via an assigned MIDI controller) to play the same cycle faster or slower for sudden variation. This also synchronized the playback speed of the corresponding home movie clips (and their audio) mapped within Resolume, This was stimulating to try live and facilitated new visual and aural textures and often caused significant improvised musical interactions between group members.

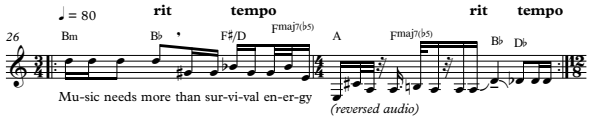
I have created a similar signal flow in my piece *Lately there has been….* whereby the trumpet player (or any frontline instrument using a microphone) can play notes to trigger successive video clips of written words - that together form phrases from two of my own poems. This was a new solution for generating a jazz composition for me, and the effect of seeing words appear simultaneously with heard pitches from an instrument potentially primes both the music and words with more, and multiple meanings. To begin, I added harmony (chord changes and various modes for melodic choices) to particular words of the first poem to give them emphases, and to bookend musical 'phrases' or gestures. These were conceived very much within a speaking or reading pace, and the musical

result is rubato tempo. Word or syllable changes occur on the screen with each note attack/note on message, and this first poem was mapped to both my MIDI keyboard and the acoustic trumpet. Achieving this was quite simple; I created Text Animators within Resolume for each word (around 137), and utilized Yehezkel Raz's Max for Live patch Trigg.me within Ableton to send out a MIDI note bang (over a virtual MIDI bus) to Resolume when audio input is detected. Further expressive potential occurs when each player takes 2liberty with note choice, length and musical 'phrasing' of the text. MIDI note on messages were mapped to the Trigger Next Clip function within a video layer in Resolume to step through clips; 'word by word'. The other half of the composition/improvisation extends the concept; and a second poem (on a separate layer within Resolume) is now added and triggered by the trumpet (again at a rubato pace), whilst the keyboard improvises at a faster pace, shuffling through the words of the first poem rapidly. Both poems are now 'interacting'

As the second poem is housed on a separate layer within Resolume, this required the trumpet to change audio and MIDI channel to trigger the new text layer (as the keyboard still required the first).

I will suggest a future application of the Trigg.me patch within improvising jazz groups – to be used as an 'intensity peak' trigger. When an ensemble is reaching a (predefined) high volume level (often in the pursuit of jazz 'tension' or 'release' gestures), an ambient microphone could be utilised to generate a Trigg.me MIDI message to fire new clip content and effects within visual software. This would emphasize and potentially compliment the live group dynamic within the performance. Apart from video content, an assigned MIDI command to open the signal flow would be needed - the only other consideration being an appropriate threshold level for Trigg.me.

a sentence spoken by bassist and singer Esperanza Spalding during a panel discussion in New York (Winter Jazz Fest, 2018), then reversed and looped:



I was able to create further improvising musical interest and texture augmentation by 'scrubbing' or 'scratching' through video segments. This was achieved by mapping Clip Speed and Selected Clip Transport Position parameters within Resolume to midi controllers, in my case foot expression pedals. Overall, the described disparity and breadth of tempi, metre and texture is not necessarily something I would have achieved otherwise within one jazz composition. I am also encouraged that I could directly engage and address an extra-musical concern or topic (even if the subject is music making) through the use of additional media.

together, and the indeterminate nature of the word presentations potentially illicit new text meanings:

Figure 3: Two poems triggered by two different instruments occurring together.

I also created a piece entitled *Boys Club,* which draws on found video content exploring the issue of prior and modern-day male dominance within the jazz artform. I have spliced short, found video clips of phrases from interviews with women, or from documentaries around sexism within the music industry and again mapped these clips to one visual layer within Resolume. I temporarily circumvent Ableton and map MIDI notes directly to Resolume via my MIDI foot pedal hardware. I am able to perform alongside this video material, controlling about ten clips on the fly in an improvised manner. Each clip has a unique feel and 'tempo'. I used BMP Sync within Resolume and specified a number of beats for each clip within the Transport controls to generate a 'time signature' for each fragment. The individual nature of these clips easily inspired me to write musical phrases to accompany, sometimes matching the pitch content of speech within my melodies. The following figure shows one example,

7.2. Mapping Ableton Live effects to Resolume

One idea for creating strong links between acoustic sounds and extra visual/audio material within jazz performance - was that an improvising soloist could not only improvise with their musical material, but also with visual content. Successive 'solos' could be rather unique, each member having their own language, stock samples or ways of manipulating content.

A logical first step towards (again) this aesthetic of synchronization was to map some of my own existing effects I perform with in Ableton Live to extra video effect parameters within Resolume. With Mattijs Kneppers' Parameter Forwarder, I am now able to simultaneously harness video effects when I apply audio effect parameters to my sound. These are arbitrary, but try to animate or represent the chosen audio effect toward

further impact and emphasis to a musical idea. The effects are all placed on the Master audio output channel within Ableton. They can also be applied to a different ensemble member (e.g. saxophone or trumpet) via a microphone input. The effect mappings I found useful and representational are listed in the table below:

Effect in Ableton Live 9	**Parameter**	**Resolume 6 Visual Effect**	**Parameter Target**
Auto Filter	Frequency	*RGB*	Distance
Auto Filter	Frequency	*Fragment*	Opacity
Grain Delay	Pitch	*Twitch*	Global Twitch
Knob 1 Frozen Smear	Short Long	*Trails*	Feedback ('Lighten' mode)
Knob 1 Fade to Grey	Short Long	*Trails*	Feedback ('Lighten' mode)
Master Track volume	Volume	*Common/ Master*	(master opacity)
Megagflexion	Dry/Wet	*Mirror Quad*	Opacity ('Meta Mix' mode)
Megagflexion	Dry/Wet	*PolarKa-leido*	Opacity
Megagflexion	Freeze On	*Fragment*	Opacity
Resonators	Note, II Pitch, III Pitch, IV Pitch, V Pitch	*Wave Warp*	Opacity (Blend Mode = 'Lighten')
Beat Repeat	Repeat On	*Wave Warp, Tint*	Height, Opacity

Table 1: Ableton audio effect mappings to Resolume video effects.

8. CONCLUSION – NEW POSSIBILITIES FOR SEMANTIC IMPACTS

This paper has identified screen use in western society and music communities as universal and unrelenting. It also managed to categorize some existing practice of live jazz performance making incorporating digital/moving image.

Surely the options and scope of forms embracing images and video - for example an emphasis on Realism, the Abstract or the Representational - give the jazz musician the chance to say a great deal within performance. And conceivably, jazz can still retain identity. Or as Charles Altieri writes in *Art and Representation*: "…the sign, which differs from what it represents, can take on that additional signification, how it can be itself and also a figure within a larger practice." (Sukla, 2001, pg. 244). That is to say jazz can still be Jazz (the 'sign'), yet also has opportunity to signify and point to newer themes.

If jazz can overcome the current credibility challenge around issues of gender, diversity, and power through continued debate, discussion and cultural/institutional change, then perhaps it can again emphasize it's historical roots - and do things like challenge social norms and inequalities around racism, discrimination, respect, exploitation, segregation and integration. Themes of surveillance and censorship and abuse of power through technology are not going away either, and these have been part of multimedia's lineage from the beginning.

And the lines between 'stock', 'archive', public domain and now perhaps even streamed video and images are becoming blurred, as is authorship. Notions of collage and pastiche in new jazz works have never been so easy to assemble as now; assisted through the likes of YouTube, Vimeo, powerful search engines and the ability to contact artists directly for copyright clearances if appropriate. We may then give further emphasis toward digital and moving image as a response, metaphor or criticism for our times. This would surely contribute to wider notions and agency of jazz, and expose jazz music making to a larger, more diverse range of exponents and participants.

Using groups like Edit Bunker and Tin Men and the Telephone as a departure point for invigorated jazz music practice gives rise to many themes and conceptual pathways. It is hoped that the descriptions of my own works and signal flow between Abelton Live and Resolume Avenue 6 and other software may be useful for one wishing to take initial steps to expand their own music performance towards the multi-media realm.

There are other possible technology alternatives to a VJing conception, but they have not been discussed here. These would include the potential of the stand-alone version of MAX (Cycling 74 software) – with its excellent handling of MIDI, and the user's capacity to connect, control and compose for an exciting array of other interfacing systems. These include Arduino boards (user-built hardware that can comprise of electronic sensors,

motors or other components), DMX (Digital Multiplex, one of the main standards by which to control digital stage lighting and effects), and complex multi-screen projection scenarios.

Jazz fused with digital and moving image could well be a breath of fresh air by which we manage to offer further understandings of our culture, be culturally aware and perhaps even better understand our music - in this day and age.

Yet the real test of whether jazz and digital/moving image actually succeed together will be to what extent the associated new creative offerings innovate and produce actual new forms of Jazz itself.

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