

John Cage's Atlas Eclipticalis: Paving the Way to Anthropocentric Processual Creation

Tzu-Eng Ngiao

Abstract

The bulk of artistic and philosophical discussion generated by our intellectual fascination with John Cage's orchestral work Atlas Eclipticalis (1961–62) centres around its application of aleatoric processes such as the elements of chance and indeterminacy in the stages of composition and performance. That which underlies Cage's advocacy for and championship of aleatoric explorations is his musical philosophy of non-intentionality. In his views, intentionality stood against genuine artistic expression, or rather, the true expression of the Self through music. This resistance against prevailing musical convention remains relevant in contemporary practices. However, we have often overlooked the role and implications of Cage's employment of an arbitrary graphical source in the composition of Atlas. The use of a graphical source to determine musical parameters draws tantalisingly close to the creative notions behind graphical scores, graphical notation and musical imageries. Common to all of these notions is the relation between any given musical artefacts and any graphical representation or visual imageries they may invoke. Although the graphical elements of the star chart are static and held in place by fixed relations, Cage's act of mapping them into musical elements eventually brought about the processual unfolding of musical events. What can be read from the conception of Atlas is more than the concern about intentionality; it also extends a n inextricable link to process philosophy and phenomenology. Hence, in this work we find a unique convergence of several lines of creative inquiry – the deployment of an analogous graphical counterpart for producing the musical score, aleatoric devices, and the philosophical back-story of non-intentionality and beyond, in the act of music composition and performance. The utilisation of a graphical source from which the music is being 'drawn' out deserves particular attention relevant to the graphical or imagerial incarnation of music, as found in graphical scores. A dissection of the peculiar traits of graphical scores under the context of visual music leads one to speculate if music that more precisely operates on a tight correspondence between musical and visual elements can be conceived, in order to give rise to anthropomorphic visual imageries in particular. There seems to be no lack of intellectual substantiation from evolutionary, musicological and creative viewpoints in shoring up a compelling case for musical hermeneutics in terms of anthropocentric narratives. Furthermore, in some of the contemporary graphical scores compiled by Cage himself in Notations (1969), we began to witness an impending inat ion of anthropomorphi c images onto conventional musical staves, occupying and sharing the role and status formerly belonging to standard musical notation. Supported by technological advances, the musical score complex today extends to encompass reconble score environments, live interactive music systems, and even mixed-media immersive installations, that

allow for more substantial multimodal and philosophical creative engagement. The author sees that Cage's artistic and philosophical quests embodied in the creation of Atlas 50 years ago inevitably pointed forward to a mode of musical composition and complex score environment that draws on the simultaneous processual constitution of musical entities along with anthropomorphic graphical elements.

***Atlas Eclipticalis* (1961-62)**

I first came across John Cage's *Atlas Eclipticalis* while researching the existing literature of musical compositions based on graphical properties found in visual artworks for my master's thesis a few years ago. At that time, I was very much fascinated by the concept of translating an integral set of graphical properties into music which seeks to preserve and reflect analogous relationships between these cross-domain aesthetic elements. In *Atlas*, Cage traced a map of the stars onto music manuscript papers and then turned these graphical inscriptions into musical parameters (Downes, 1970; Pritchett, 2000). This elaborate method makes it one of only a handful of works whose conception has taken to striking a balance between a more faithful observance of the graphical constructs of the visual source and subsequently translating and assimilating them into their final musical counterparts. Merely considering his method at face value, I was largely oblivious to the wider artistic and philosophical discussion that centres around Cage's application of aleatoric processes involving a graphical source (the astronomical chart), and his philosophy of non-intentionality. Now in celebration of a vibrant 101 years since his birth – a period within which he wielded unwaning influence for over half a century - it is high time we re-contemplate the greater implications of his ideas and philosophies, as encapsulated in *Atlas* towards the field of audiovisual creative practices in an age wreathed in exciting modern responsive technologies.

Aleatoric Processes, Graphical Source and “More-than-intentionality”

According to Benjamin Piekut (2011), aleatoric techniques in *Atlas* can be identified across different stages of musical creative processes. He also highlighted the basic difference between the use of chance operation and indeterminacy in the work. The elements of chance come into play when musical pitches, along with their prescribed dynamic levels and sounding duration, were produced by tracing the size and spatial positions of individual stars on the astronomical chart. On the other hand, the spirit of indeterminacy is conjured when the conductor and performers are given the freedom of choice, though limited, to decide on various musical parameters circumscribed by Cage's performance instructions¹. The use of aleatoric processes embodies Cage's explicit desire to undermine the frigid grip of learned, contrived musical intentions. In his view, musical intentionality stood against genuine artistic expression, or rather, the true expression of the Self through music. Hence, aleatoric procedures were called upon to limit the performers' (and even the composers') reliance on conventional

¹ For musical examples on the mechanics of chance operation and indeterminacy employed in *Atlas* and the work's historical reception, refer to *Chapter 1: When Orchestras Attack!* (In Piekut, 2011).

approaches and hackneyed devices to musical form, melody, phrasing, articulation and so forth. Even though the aleatoric device, along with the audacity and force with which it had broken new musical ground, has lost its sheen with the erosion of time, its embodied spirited resistance against prevailing musical convention remains an artistic virtue worthy of being upheld regardless of the musical era we find ourselves living in. Yet the significance of *Atlas's* breakthrough in terms of compositional method does not lie solely on its advocacy of aleatoric techniques for it counts only as one amongst a collective output of Cage's that happens to promote the aleatoric agenda. The real headway made with this particular work owes much to his appropriation of a graphical source in deriving the course of chance for his musical materials. The use of a seemingly arbitrary graphical source to determine musical parameters draws tantalisingly closer to the creative notions behind graphical notation, graphical scores and even musical imageries.

Despite the graphical elements of the star chart being static and held in place by fixed relations, Cage's very act of meticulously mapping them into musical elements and subsequently breathing life into them with aleatoric instructions eventually brought about the temporal unfolding of musical events. During this process of tracing the stars in the 'composition' stage, the simultaneous and incremental emergence of musical notation points to a processual creation striding across the visual and musical domains. The final score can be viewed as an ossification of what is essentially a multimodal creative process, much like visual movements captured on film. In other words, the music, and its graphical analogue, was not preconceived prior to its being committed to paper. Although Cage had not written much to explicate this specific method in *Atlas* in the form of a targeted, extended philosophical exposition or reflection, we may safely infer here an added dimension to his long-standing revolt against conventional and representational logic. In fact, Cagean aesthetics, as exemplified here by *Atlas*, have been compared by Branden W. Joseph (2011) to Gilles Deleuze's anti-representational, process philosophy of immanence that views the world born out of a continual transformation by the flux of time. Hence what can be read from this particular work is more than the concern about intentionality on the composer's and performer's parts; it also extends an inextricable link to process philosophy and phenomenology in the discovery of the Self and also forms and manners of its manifestations in the lived experience. Although it is beyond the scope of this article to delve into a lengthy philosophical exegesis, one can assert that the particular mapping technique employed in *Atlas* essentially embodies two aspects of the act of music composition, which is also an act of self-realisation, as pertained to the central concepts of process philosophy and phenomenology. The simultaneous composition of visual and musical elements resonates strongly with the ethos of process philosophy, which describes the mechanics of living as ongoing processes affected by certain relations.

In *Atlas*, the star chart clearly underpins a cross-domain relation between the visual and musical processes. The other aspect relates to the involvement of the composer's creative consciousness and intuition during the very act of composing such visual and musical elements. The resultant musical score is more an imprint of the phenomenon of the composer's intuitive encounter with a given graphic source rather than a mere contrived rearrangement of learned musical idioms and entities laden with standard

representation or signification. In other words, the composer has voluntarily forgone a conscious grasp of what music should sound like and delegated the substance and direction of the music to the graphical properties of the star chart. He then set down performance instructions to the traced notes according to further intuitive reaction to the musical/visual materials at hand. This particular aspect chimes in well with the phenomenology rationale that exalts the merits of the intuitively lived experience.

Hence, in *Atlas*, we find a unique convergence of several lines of creative inquiry – the deployment of an analogous graphical counterpart for producing musical elements, aleatoric devices, and the philosophical back-story of non-intentionality and beyond in the act of music composition and performance – that ineluctably weaves up the intellectual fabric serving as the basis for the entire act of composition. The utilisation of a graphical source from which the music is being ‘drawn’ out deserves particular attention under the relevant context encompassing the graphical or imagerial incarnation of music in general – the graphical score. Where does this boundary between the graphical source and the graphical inscription of the music it gave rise to (i.e. the score) begin and end? The composition process adopted in *Atlas* seems to have instigated a mitigation of this duality between the two constituents. Guided by Cage’s invisible hand by way of his unremitting legacy and influence, we are persuaded once more to question the very nature of being of the artefacts whose existence we often take for granted; in this case, our fascination is piqued towards the elusive ontology of the graphical score.

The Intrigue of the Graphical Score

A musical score is originally defined as the printed or written medium for a composer to communicate instructions to performers on how to bring his thoughts into sonic realisation. These written indications traditionally take the form of standardised musical notations that hold information on sonic parameters such as pitch and duration. As composers’ demand for ever increasing complex nuances of pitch inflection, timbral variation and dynamic range and colours, so too did the graphical complexity of musical notation employed increase. In some of the most extreme graphical scores, the visual impact of notated music came to resemble the beauty and complexity of visual works of art (Sauer, 2009). Hence, upon contemplating the development of graphical scores, one begins to wonder if the production of graphical scores extends beyond mere practicalities and involves the extra dimension of visual composition in addition to the primary act of musical composition.

It seems fair to say that, to a certain extent, the act of composing music in graphical notation affects the outcome of the creative process on two fronts: How a piece of music should unfold in sound as well as in visual notation. Would it be possible that on occasion, a composer may devote more attention to refining the visual outcome of the graphical score at the expense of musical aesthetics? And during the creative act, if the balance were to tip in favour of visual imageries, what kind of music or sound organisation shall emerge? In any case, it is not our aim to close the loop on these questions here. Rather, we would like to further explore the potential directions for music composition and possibly in other artistic avenues that have been opened up

by asking these questions. What is certain is that the simultaneity of the intertwined creative composition process, both in the musical and visual domains, is uniquely associated with graphical scores.

One may point to the possibility of finding similar processes at work in the sphere of visual music or film sound tracking. However, this may be refuted by the fact that in these examples, the creative process in one domain often precedes the other. In visual music or film music, the creators of the visual elements and musical elements are often separate individuals. On the rare occasion that the artist is fluent in both the visual and musical languages, he may still have to create a sizeable amount of visual materials before proceeding to create the complementary accompanying musical materials or vice versa. In other words, the correspondence between the processual creation of musical materials and graphical materials were never as concise and tight down to the most discrete temporal slice as that which could be achieved with the composition of graphical scores. In the process of composing a music score, every single musical event intended to unfold in time is notated down on a visual template (be it on paper or the digital screen) and immediately corresponds to a single unit of graphical event as embodied in a fundamental unit of graphical notation. Hence, the two key features inherent in graphical scores are: The processual element and a strict musical-visual correspondence.

One must admit that visual music is a difficult beast to pin down with sweeping generalisations but certain trends do stand out above the rest (Evans, 2005). Built on the multivalent premise of musical signification, intermodal correspondences and multisensory perception, the aesthetic appeal of visual music can mostly be attributed to the fluid negotiation across the spectrum of arbitrary and rigorous correspondences between music and visual elements. But often, it thrives on the more arbitrary end of correspondence due to the inhibiting and even, emasculating effect on artistic richness, fluidity and nuance, of a cold, rigorous point-on-point approach. Take the case of the fundamental operation of a colour organ. The musical-visual correspondence is tight, as every single key, hence every musical tone on the instrument is uniquely mapped to a single colour. The visual outcome of this bare-bones operation of correspondence may not be impressive but there is considerable room to develop and raise the visual aesthetics by deftly adding on more complex additive and integrative functions on the elemental visual materials. The case of the graphical score is in many ways similar to the operation of the colour organ. On a more sophisticated level, a graphical score, if implemented in an interactive software domain, may offer a platform which is infinitely more accommodating to denser instrumentation, more complex and nuanced parametric control and layering as well as potential realisation of a vastly richer visual palette.

The dissection of the peculiar traits of graphical scores under the context of visual music leads one to speculate if music that more precisely operates on a tight correspondence between musical and visual elements can be conceived, in order to give rise to anthropomorphic visual imageries in particular. Should this concept involving a rigorous correspondence between music and anthropomorphic visual elements be incorporated into the creative process of music composition where the composer can 'see' where the anthropocentric² visual narrative is heading as he revels in the act of

² The term 'anthropomorphic' is used throughout the article to refer to visual elements associated with the depiction of the human face or figure. Creative approaches that emphasise the central role of anthropomorphic depictions are described as 'anthropocentric'.

creation? And what may be the reason behind the appeal of taking an anthropocentric predisposition in regard to visual imageries when the art of visual music has healthily thrived, largely by playing along with visual elements engaged in the realm of the abstract?

Anthropocentric Narratives: The Evolutionary Case

Perhaps our natural visual attraction to human figures and a penchant for apprehending causal events and storytelling may partly explain our appeal to anthropocentric narratives. In *On the Origin of Stories*, Brian Boyd (2009) gathered compelling evidence from scientific studies that argues for such tendencies as results of our evolutionary adaptation and hence are inevitably hereditary. Newborn babies are known to be able to instantly attend to faces amongst all other visual stimuli and their limited ability to focus within the range of about eight inches allows them to make eye contact with the mother while suckling on her breast. Their sensitive attention to human faces also helps them in imitating humans but not mere animated models. An infant's ability to identify anthropomorphic features are bolstered by attendant perceptual 'theories' of objects whose development long precedes their first feel for language. These theories of objects help them make visual judgments about object trajectories, causal effects on object support and contact as well as object persistence, concealment, containment, occlusion, protuberance via cognising object coherence and cohesion. This is then followed by the development of the theory of kind, which describes children's ability to classify 'things' as conspecifics (other humans), animals, plants, and artefacts by making inferences based on major ontological distinctions. Animate objects are distinguished from the inanimate by recognising how they move with non-rigid self-propelled motion and how they can interact without contact. Children know how to look for the head or face on an animal but not on a plant; and they will process cues on human faces but not on other animals.

Concurrent to the development of our cognitive faculty in differentiating between animate and inanimate objects and between humans and everything else, we are also genetically wired to connect visual cues in terms of possible causal effects and sequences, as we have seen embodied in the theories of objects. Recognising these agencies of causality in a timely manner may decide our survival in the face of urgent threats or opportunities. It has been shown how we, as human beings, could not resist from seeing a sequence of moving dots in terms of animate causality. In a famous experiment, a group of students were treated to a film by Fritz Heider and Marianne Simmel (1944) showing random movements of two dark triangles and one dark circle around a stationary rectangle, with part of its one side dislodged and pointing outwards. All the students except one were independently recorded to have made narrative descriptions of the film in terms of individuals in conflict, such as two men vying for the affection of a woman. These studies consistently testify to our instinctual propensity to grasp and interpret events in the most impactful way – as a series of causal, narrative happenings. While these theories explained why we are inclined to spin things into the form of stories, what then, could be the biological bases that urge us to recount these stories to other people? In this regard, it is important to assess our evolutionary motifs on the higher order of societal scheme.

As a natural extension from the theory of kind, the theory of bonds describes the intuitive basis that underlies the terms of our social relations. It suggests that we tend to align our modes of affiliation and association (kinship, friendship, alliance, group identity) to our self-serving evolutionary advantages such as guarding our genetic lineage. Also looking to ensure the preservation of similar advantages under the context of larger societies, we, as social animals, are also keen on tracking our terms of hierarchy, status, or rank within our species. The last aspect of the theory of bonds touches upon the specific modes and mechanisms of our social exchange: The complex use of moral emotions and actions – such as empathy, self-righteous indignation, forgiveness and reconciliation, generosity and gratitude – to solve problems of trust and commitment. One of the ‘tools’ employed in our social exchange involves our capacity for detecting cheating in social relations. And to be able to share strategic social information with other people for the benefit of the society as a whole may explain our need for narratives. To be able to tell stories as an altruistic, contributive act to the reinforcement of social monitoring will also earn us the respect of our society. However, according to the theory of mind, the function of narrative may be more than mere sharing of social information. It allows us to mine for even subtler, more precise, and multiperspectival understanding of the beliefs that drive our desires, goals and intentions. Hence, as human beings, anthropocentric narrative not only sharpens our skills at intuiting and inferring such elements, but also better equips us with the ability to reposition ourselves in the complex psychosocial environment through our grasps of dramatic irony and parables.

Anthropocentric Narratives: The Music Narratology Case

According to musical semiotician Eero Tarasti (2002), traditional musicologists such as Dahlhaus, Adorno, Newcomb and Meyer tend to understand and see narrative manifestations on the surface level of any musical discourse, which they attributed to the sense of a particular style or “gesture”. He states that music’s ability to convey extramusical meanings by means of “topics” was epitomised in the Classical period of Western music. Situated in the contextual domain of the Classical style, these topics may range from styles and devices borrowed from another musical period such as Baroque counterpoint in the *gebunden* style to the Classical concoction of dramatic *Sturm und Drang* or ‘Storm and Stress’ passages. Needless to say, these topics are founded on their fundamental links to specific musical devices or processes. While the *gebunden* style is typified by the use of suspensions, ‘*Sturm und Drang*’ is characterised by the featuring of diminished seventh chords elaborated by strong angular melodic contours, sudden and rapid tempo and dynamic changes. Due to the intensification of correspondence with philosophical and expressive subjects in paintings and literature in the Romantic period, musical topics have expanded to include notions of the macabre, pastorality, religiosity, heroism, and various strands of Faustian conflicts. Musical semioticians compare these topical signs to individual, discrete signs in music as exemplified by particular chords, melodic motives, rhythmic cells, or instrumental timbres. What follows is the syntactic combinations of related topical signs that in turn gave rise to expressive units of a higher order known as musical ‘themes’. The cogency

and cohesive force behind the idea of thematicity became a powerful tool not only to the investigative disposal of musicologists in their analyses of existing music, but also to composers in the refinement of their craft. In his role as a musical analyst, Rudolph Réti (1962) explains the development of large scale musical works by tracing the evolution of their primary motifs (or themes). On the other hand, thematic units form the kernel of Arnold Schoenberg's (1975) compositional principle of the 'developing variation'. This inevitably leads us to ponder upon the particular paradox posed by the treatment of 'themes' from both the compositional (creation) and the analytical points of view. Did thematicity in a piece of music arise because the composer has intended it that way or is that purely an analytical artifice imposed on the music by musicologists? Before seeking for a possible response from the literature that attempts to address this seemingly tricky question of circular cause and consequence, let us take a look at further implications of the semiotic stance of music as signs, topics and themes.

If music were to be interpreted as signs, as stipulated in the theory of musical semiotics, then we would naturally be inclined to search for the potential meaning and significations carried by these signs. If indeed there are meaning and significations to be unscrambled from listening to music, surely they can only be made on human terms. Upon the analysis and interpretation of music, are humanistic values merely assigned to musical signs, topics and themes as a matter of descriptive convenience? Or are they the true representation of meaning in music? According to Esti Sheinberg (2012), the highly regarded music theorist of our times, Raymond Monelle, maintained that "semiotics is innocent" and should be free of any agendas or a-priori values; that it looks at the operation of signification rather than what is signified. However, meaning is inevitable and inherently intermodal. As aural sign-systems, music's inter-correlation with other systems of modality such as "dramatic, political and social narratives, historical contexts and rhetorical devices" will always colour our interpretation of the meaning of musical contents. Byron Almén (2008), during his search for a theory of musical narrative, took note of Hayden White's (1973) observation of "the tendency of historians to consciously and unconsciously emplot historical events according to temporal narrative schema". White, like Almén, was in turn, influenced by Northrop Frye's (1957) identification of the four mythoi – archetypes of narrative motion: Romance, tragedy, irony, and comedy. Frye's literary mythoi had motivated Almén in fashioning his musical narrative archetypes. At the same time, Almén was also inspired by Tarasti's (1994) "application of the notion of "modality" to music to account for the encoding of human values into musical discourse" as "a way out of the arbitrary assignment of expressive characteristics to music". In assessing Monelle's proposition of the theory of musical topics, Sheinberg believes that Monelle would not have disapproved of topic theory's role of asking 'what does this music signify?', beyond the mere question of 'how does music signify?'. She also believes that musical gesture may find it hard to deny its building on the foundations of "brain functions and natural motions of the human body", which in turn provides the means and connection to universal aspects of human communication and signification including "modes of thought organization" as well as "emotional expression".

The above are just some of the views on music signification and their modes of enquiries in connection to human cognition, emotions and even to the physicality of

the human body. As we can see from the extensive literature on scholarly approaches to music signification and narrative, these interleaving strands of inquiries may prove hard to navigate. Nevertheless, anthropocentrism not only remains as a prevalent thread throughout, but also as the point of gravity around which all these inquiries are polled.

Almén contends that the phenomenon of musical narrative is rooted in a “loose analogy between literary and musical patterning”, but is acutely aware of the “problematic status of musical narrative as a disciplinary entity” and thinks that this is “reflected in a general disagreement about its nature, properties, and range of application”. Like many other scholars, he believes that the root of such disagreements lies in the fundamental distinction between music and literature in the aspect of narrative discourse, namely, “the absence in music of referentiality, a subject predicate relationship, a narrator, and a past tense”. But this does not put him off from the “hope of establishing more substantive theoretical foundations”. He thinks that skimming too closely to seeking a specific relation between musical denotation and literary denotation would be cause for disappointment as we shall forever be bound to the view that music is insufficiently and ineffectively narrative.

And he still fully concurs that “musical narrative, construed as an analogy [to literary narrative], is sufficiently motivated to render it useful and productive for interpretive attention” and that we may begin with recognising “a common conceptual foundation” between musical and literary narrative. He prefers to understand narrative as “articulating the dynamics and possible outcomes of conflict or interaction between elements, rendering meaningful the temporal succession of events, and coordinating these events into an interpretive whole”. In this way, music can be seen in the light of its own “syntactic potentialities” and “devices for negotiating conflict and interaction”. Compared to their literary counterpart, “the relative freedom from descriptive specificity in music allows the dynamic interactions between events to be foregrounded, interactions that are fruitfully homologous with psychological and social dynamics and emerge all the clearer and with greater force in the absence of a descriptive milieu”. With such convictions, Almén suggested a subscription to Fred E. Maus’ (2005) call to “scale back our theoretical claims”, and to proceed “from a more modest analogical relationship between music and narrative, a relationship buttressed by its obvious appeal for many listeners and the analytical insight that it allows”.

Let us now briefly return to the previously abandoned inquiry regarding the circular causality of the ‘thematic’ device. Is thematicity in music an embedded conceptuality in the consciousness of the composer or is it merely a hermeneutic outcome forged independently in the consciousness of musicologists or listeners? In this regard, Almén would not take sides and maintained that these two conceptual polarities should stand feeding off each other. In developing his theory of musical narrative, he emphasises the significance of balancing this creator-interpreter views of thematicity. In his opinion, the creator-interpreter dialectic is basically parallel to a deductive-inductive dialectic. Speaking of the point of reference to his own method, “Frye’s deductive taxonomic system and Tarasti’s inductive analytical methodology embody balancing impulses that might work effectively together”. All in all, Almén seems to underline the lively impulse and affinity on both ends – the creator and the interpreter – towards a narrative codification and comprehension of musical events.

Anthropocentric Narratives: Western Music and the Legacy of Wagner

Musical narrativity reaches its height during the Romantic period in the course of Western music. It is no surprise that musicologists whose main line of inquiry touches upon narrativity are particularly focused on music of this period. American musicologist Anthony Newcomb is among those who passionately championed a Romantic narrative discourse. Almén recognizes his colleague, Newcomb's view of musical narrative as "a historically bounded and primarily Romantic compositional impulse". And that musical narrativity became for Newcomb, "a way of recovering a Romantic compositional aesthetic". In dissecting the evolution of musical narrative, Almén noted examples delineating "the prevalence and historical appeal of describing music via an analogy with literature, drama, or language", and went on to identify the Romantic composer Richard Wagner's "explicit harnessing of the principles of foreshadowing and recall, supported in part by a web of leitmotivic associations". The narrative clout of Wagner's music remains indomitable in the history of Western music largely due to his method of identifying and tying dramatic characters in his music dramas to the melodic device called the *leitmotif*. Tarasti ruminates that themes began to unabashedly carry extramusical messages and took on the form of "signs of certain narrative protagonists popular in the time of Romanticism". According to him, "the Romantics started to privilege themes that were Lied-like (song-like) and hence could be cognised fully on first hearing, thus having an immediate impact by portraying their object iconically, indexically, and symbolically". Although themes or leitmotifs, as Wagner would attempt to re-appropriate it in his own terms, were closely connected to the melodic artifice, Tarasti noted that their growing importance as a musical cohesive force was, at the same time, undermined by the weakening of the tonic-dominant hierarchy in the tonal discourse of Western music. Ironically, Wagner not only elevated the hierarchical status of the leitmotif as a musical contrivance, but was also attributed to the instigation of the dissolution of tonal harmony. Hence by the end of the Romantic period, composers such as Arnold Schoenberg not only inherited Wagner's dissolution of tonal harmony but also his influential idea of the musical motif as a unifying structural force in music. As atonality continued its inexorable disintegration into the non-hierarchical, undifferentiated world of the 12 pitches in dodecaphonic music, so too the foundation of the melody, which had historically been inextricable from tonal harmony, was being pulled away from under the feet. Without the backing of harmonic tonal centers and cogent melodic constituents that flourished from within them, Schoenberg began to grapple with how to re-institute the coherence and tangibility once associated with the concept of the melodic-harmonic motif. His "solution" came in the form of motivic transformation that sets to define the structural unfolding of a piece of music from a germinal unit of musical motif. This in turn led to his invention of the twelve-tone row which imparts its structural role upon the music through basic transformative mechanisms of inversion and retrogression. However, Tarasti reckons that the major developments of Western music, which in their own way, are largely "unsemantic" or rather, semantically remote from the familiar forms found in tonal musical language. He compares the matrix of serial music to "elements of second articulation in language, i.e., phonetic units", and that "the only difference being

that the elements of a twelve-tone matrix do not form recognizable lexicographical units". That with motivic tone-rows difficult to discern aurally, coupled with the fact that figures are hardly repeated, these semantic entities "remains weakly articulated despite the fact that it is based on a certain 'grammar'". On the Minimalist movement, he opines that the active repetition of figuration, came across as "a succession of reified "now"-moments". And because these moments "represent pure durativity, in the sense that they have neither beginning nor end", Minimalism too, can be considered "totally anti-narrative". When it comes to the movement of spectral music, where we see the musical pitch further refined down the granular level to its constituent overtones, the musical language "seems to subsist on the 'subsemantic' level of 'protointonations'". In a way, the "theme-actor" concept that proves vital to the operation of musical narrative seems increasingly irredeemable as the development of music steps further and further away from Wagner's idea of the leitmotif. Although these major movements in the musical arts have helped defined the respective aesthetic values of different generations, such traditional borders of aesthetic definition have been steadily breaking down in contemporary musical thoughts and practice. Rather than comfortably falling back to the old ways, we see composers and musicians freely assimilating the rich assortment of musical languages they inherited in search of contemporary expression. In these times, the idea of having a well-defined melody is no longer seen as an aesthetic taboo in the same way as it has often been ostracised by dogmatic musical factions. Hence, how does this bode for the age-old concept of motif-character (or melodic-character) affiliation? Does the return of the melody also possibly imply the return of anthropocentric representation in the interpretation of music?

The Score Complex

By all accounts, there seems to be no lack of intellectual substantiation from evolutionary, musicological and creative viewpoints in shoring up a compelling case for musical hermeneutics in terms of anthropocentric narratives. But what has the side of musical creative praxis – in pertinence to the musical score in particular, got to say about this? Have we not implicitly concurred that theatrical action and narrative have a significant bearing on the course of music composed in parallel by eulogising the Wagnerian theme-actor paradigm? A Wagnerian opera score is necessarily inscribed with texts indicating the corresponding stage actions, but these could theoretically be replaced with graphic images if space on the score would allow for them. The musical score has come a long way since the days of Wagner and has expanded and multiplied into a plurality of critical modalities previously unimaginable. In some modern scores, we began to witness an impending infiltration of anthropomorphic images onto conventional musical staves, occupying and sharing the role and status formerly belonging to standard musical notation³ (Cage, 1969; Sauer, 2009). Yet why

³ Despite Cage's prevailing suspicious attitude towards explicit human intention expressed through music-making activities, he seems not to have made any solid proposition against an anthropocentric interpretation imposed on musical stimulus. Even if we assume that he might have been against such interpretation, he would have focused on a preemptive approach by advocating specific compositional methods rather than attempting to dictate or prescribe a particular mode of listening for the audience. His undertaking in compiling a book on modern notation (Cage, 1969), that contains bountiful examples

hasn't this initial probing at the exclusive domain of symbolic notation transpired into full-blown anthropomorphic representation? Other than the obvious fact that we still need conventional notation to denote precise pitch and durational information when they are called for depending on artistic exigencies, there remain a few challenges standing in the way of such developments.

First of all, musical events operate on temporality and entail the extension and continual development of musical entities along the time domain; whereas anthropomorphic imageries require clear-cut, closed boundaries at all times and necessarily limit the durational stretch of any musical 'object'. This would not be an impediment, of course, if all musical objects were to figure for a reasonably short time-span as in a melody or motivic fragment. However, a musical work saturated with melody after melody without reprieve would hardly make for a critically satisfying musical experience. In order to avoid a score saturated only with anthropomorphic images and to allow for less figurative and more textural musical passages to flourish, it seems highly appropriate that conventional musical notation be separated from its corresponding imageries while maintaining an explicit, rigorous, analogous correspondence.

Another reason why we are probably still inching into a more elaborate anthropocentric graphical score environment with much trepidation is because once anthropocentric musical imageries are evoked and made tangible, we are practically stepping into artistic territories already defined and owned by traditional disciplinary provinces such as theatre, musical drama, film, and visual arts with music etc. Regardless of such minor challenges in ontological categorisation, the unique intersection of musical-graphical intermodal inquiry coupled with its intrinsic philosophical discourse still falls more fittingly within the critical realm of the musical score.

With its embedded plurality of modalities and philosophical dimensions, the musical score complex constantly stands at the forefront in new and experimental music due to its evolving ability to indulge our boundless innovative tendencies. Pedro Rebelo (2010) identifies the roles and functions of notation in musical scores as not only to document and communicate, but also to reflect. Rearticulating Donald Alan Schön's (1983) idea of the process of creating or designing as "reflection in action", he asserts that "notation can be seen as a generative environment that serves this reflective conversation with the situation". For Rebelo, the possibility of "reflective action" effectively "repositions notation as a mode of creation in itself and distances it from the purely mechanistic task of transmitting and communicating 'ideas'.

Resonating with Cagelan philosophical thinking, Rebelo further expresses that "at the very essence of a phenomenological approach to notation comes the understanding that rather than a tool to express ideas, notation is, like language itself, a generator of ideas, an embodied experience and an action in itself". In working with musical scores realised in a technological medium, he sees a reconfigurable score environment as capable of uniting and inviting "reflection and engagement (from both composers and performers) rather than execution". And with such a form of re-engineered notation, "the notion of production becomes central". The score as a platform of production

of scores infused with anthropomorphic images, may be taken as a tacit approval of the adoption of an anthropocentric position in the visualisation of musical content and intent, i.e. music score and notation.

unifies the stream of processes from creation, annotation and to performance. Its continuous reconfigurable state makes for a perpetual cycle of iterative reflection, change and interpretation; as such, it fosters dynamic collaboration and galvanises transitory, reflexive artistic decision-making distributed between composer, conductor and performer. Sandeep Bhagwati (2013), like Rebelo and many composers and interdisciplinary artists who create and experiment prolifically in our times, sees live-interactive music systems and their working performance parameters as the legitimate successor of and logical expansion of the traditional score and notation. In fact, we may tenably posit that this technical/cultural evolution of the score has sprung forth from seeds first sown by Cage through his revolutionary perspectives and metaphysical readings on the role of notation. Bhagwati's live-interactive scores, which presupposes a reasonable amount of reconfigurability via technological means, bear similarities to Rebelo's idea of notation as a generative environment seeking to "intensify the hermeneutical engagement that characterises our relationship with a text of any sort". In his attempt to make sense of the multifarious notational perspectives profusely cultivated in contemporary "hybrid music ecology", Bhagwati asserts that live-interactive scores are leading us to new notational conditions and grammar that unleash remarkable potential to negotiate the parity of creative engagement between composition and improvisation. He sees the notation of music, "occasioned by technical media" fomenting "a new kind of musical aural/orality"⁴; a transformative movement that will fluidly give rise to "scores that restrict the range of parameters they want to control" and alternately, "scores that intentionally open up select parameters to the contingency of performance".

Mixed-media Immersive Environments: Further Enrichment of the Score Complex?

My recent encounter with mixed-media immersive environments such as the time-conditioning installation *Einstein's Dreams*⁵ staged by the Topological Media Lab in Concordia University's Hexagram Research Centre brings to mind many parallels in terms of the multimodal and philosophical inquiries actively explored under the broadening horizon of the musical score complex. The phenomenological philosophy of Merleau-Ponty and the process philosophies of Gilles Deleuze, Gilbert Simondon and Henri Bergson also form the underlying principles in *Einstein's Dreams*' technologically mediated phenomenological explorations. Such installations aim to open up such philosophical inquiries to the participants involved. Phenomenological stimuli via a collusion of mixed-media (real-time video, sound and lighting) induce in the participants various perceptual and affective responses through bodily movements,

⁴ Bhagwati refers to technologically mediated scores as 'phenomena of secondary aural/orality' by re-appropriating the term first coined by cultural historian and philosopher Walter J. Ong's (1982). Ong defines primitive oral culture with its attendant dialectics prior to the invention of the written medium as 'primary orality'; 'secondary orality' refers to the oral situation that builds on top of our fundamental literacy, conditioned and buffered by new media of communication such as the telephone, television, networked social media etc.

⁵ <http://topologicalmedialab.net/news-and-events/einstein-dreams-studio-workshop-march-11-to-april-5-at-the-blackbox/>

gestural and facial expressions that contribute to a new dimension in their lived experiences (Sha, 2011). Strands of responsive media are constantly reconfigured to “evolve in concert with people’s movement” while guiding them in exploring the various notions and conditions of temporality in parallel to vignettes from Alan Lightman’s 1993 novel *Einstein’s Dreams*. In fact, its many explorative aspects involving reflective action and engagement resonated fiercely with those propounded in Rebelo’s generative environment of musical notation and Bhagwati’s live-interactive scores of secondary musical aural/orality. With the ability to invoke timely sonic responses, such an immersive environment can virtually put every participant on the same creative-performative pedestal, obliterating the differentiation of roles between composers, conductors, performers and even the audience. With a nebula of configurable media strands made available to gestural modulation by participants at will (at times against will, with delayed causal effect or perhaps of involuntary provocation), select parameters of the media are variably suppressed and compounded during the course of a ‘performance’. Set up to encourage spontaneous actoriality and gestural-sensorial expressions and response of the ‘performers’ proceeding along the lines of theatrical philosophies advocated by luminaries of post-modern theatre such as Peter Brook, Antonin Artaud and Jerzy Grotowski (Sha, 2011), such environments can be regarded as being unapologetically anthropocentric in intention and motivation. In fact, such mixed-media immersive environments closely qualify as a score complex generously enriched in terms of its cross-modal substrate (now encompassing real-time video and lighting to account for full-bodied visual imageries) with the notable absence of traditional musical notation and also the redistribution of the more traditional role of the composer/improviser to the audience/participants.

Perhaps we could safely conclude that the multiple inquiries first instigated by Cage in *Atlas*, married with the vision for anthropocentric, intermodal processual creation could not have found a more amenable space in the discursive environment of immersive installations. Mixed-media environments can be viewed as the legitimate successor to the traditional musical score as charted in its evolutionary path largely facilitated by the advent of technologies. In such environments, we see the assemblage of media strands – real-time video, sound and lighting – as technological enhancement of the two fundamental modalities central to the composition of *Atlas* i.e. musical and visual elements. The processual creation (incremental, temporal production) of corresponding musical and visual elements now takes the form of live-interactive generation of audiovisual media held together by specific intermodal relations prescribed through software algorithms animating these media elements. Such relations may no longer reside in the graphical dimension and distribution of musical pitches directly derived from the physical dimension and distribution of stars in Cage’s graphical source of the astronomical chart of *Atlas Eclipticalis*. Yet, a certain rigorous relationship between the audio and visual elements is still maintained in the realisation of such immersive environments, regardless of the kind of algorithm employed. Parallel to all these, the proposition for an anthropocentric focus in contemplating musical-visual creation since the publication of Cage’s *Notations*, has now been radically transformed into the full-frontal anthropocentric discourse underpinning immersive installations specifically tailored for human participants and their sensorial experience. In a way,

the intersecting inquiries embodied in Atlas, coupled with some of Cage's expansive musical-philosophical explorations (in this case, graphical scores and anthropomorphic imageries), could potentially be given a new lease of life in the largely different climate of contemporary creative practices. This critical appraisal gave us sufficient ground to believe that by closing the remaining ontological and practical gap between the score complex and mixed-media immersive environment, multiple doors may be opened and lead us to exciting intermodal creative milieus, much as the luminous paths Cage had set alight for us from the past.

References

- Almén, B. (2008). *A theory of musical narrative (Musical meaning and interpretation)*. Indiana University Press.
- Bhagwati, S. (2013). Notational perspective and improvisation. In W. Brooks, K. Coessens, P. de Assis (Eds.), *Sound and Score* (pagination unknown). Leuven University Press, Leuven 2013/14 (in press).
- Boyd, B. (2009). *On the origin of stories: Evolution, cognition, and fiction*. Harvard: The Belknap Press of Harvard University Press.
- Cage, J. (1969). *Notations*. Something Else Press.
- Downes, E. (1970). Atlas Eclipticalis with Winter Music (Electronic Version) – John Cage. In R. Kostelanetz, P. Cummings (Eds.), *John Cage: Documentary Monographs in Modern Art* (pp. 142-143). New York, NY: Praeger Publishers. Kostelanetz, P. Cummings (Ed.), *John Cage: Documentary monographs in modern art* (pp. 142-143). New York, NY: Praeger Publishers.
- Evans, B. (2005). Foundations of a visual music. *Computer Music Journal*, 29(4), 11-24.
- Frye, N. (1957). *Anatomy of criticism: Four essays*. Princeton, N.J.: Princeton University Press.
- Joseph, B. W. (2008). *Beyond the dream syndicate: Tony Conrad and the Arts after Cage*. MIT Press.
- Maus, F. E. (2005). Classical instrumental music and narrative. In J. Phelan, P. Rabinowitz (Ed.), *A Companion to Narrative Theory* (pp. 466–83). Malden, MA: Blackwell.
- Piecut, B. (2011). *Experimentalism otherwise: The New York avant-garde and its limits*. University of California Press.
- Pritchett, J. (2000). Notes on John Cage's Winter Music/Atlas Eclipticalis and 103. James Pritchett [Online]. Retrieved from <http://rosewhitemusic.com/cage/texts/Atlas103.html>
- Rebelo, P. (2010). Notating the unpredictable. *Contemporary Music Review* 29(1), 17–27.
- Réti, R. (1962). *The thematic process in music*. New York, NY: Macmillan
- Sauer, T. (2009). *Notations 21*. Mark Batty Publisher.
- Schön, D. A. (1983). *The reflective practitioner*. New York, NY: Basic Books.
- Schoenberg, A. (1975). *Style and idea: Selected writings*. London: Faber and Faber
- Sha, X. W. (2011). *Theater without organs: Co-articulating gesture and substrate in responsive environments*. Unpublished.
- Sheinberg, E. (Ed.). (2012). *Music semiotics: A network of Significations. In honour and memory of Raymond Monelle*. Ashgate Publishing Co.
- Tarasti, E. (1994). *A theory of musical semiotics*. Bloomington, IN: Indiana University Press.
- Tarasti, E. (2002). *Signs of music: A guide to musical semiotics*. Berlin: Mouton de Gruyter.
- White, H. V. (1973). *Metahistory: The historical imagination in nineteenth-century Europe*. Baltimore, MD: John Hopkins University Press.

Biography

Tzu-Eng Ngaio was originally trained as an engineer. After finishing his studies in Electronic Engineering at the University of Hull, he worked for 5 years in the semiconductor design industry in his hometown Penang, Malaysia. In 2011, he completed his graduate studies in music composition under the tutelage of Johan Othmanat Universiti Sains Malaysia, Penang. As a result of his background in science and engineering, he has developed a composition technique whereby musical materials are constructed and organized in a highly mathematically precise manner but which serves the ultimate quest for poetic vision and expression in sound. His compositions have been performed at festivals and venues throughout the world, including Germany, Japan, Indonesia, and Malaysia. He recently began his doctoral studies on a potential framework for mapping musical logic into visual narratives.

Email: tengiao@gmail.com