Scoring *Metropolis*:

The Development of My Compositional Practice

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Abstract

This commentary documents the compositional process of writing film music for the classic expressionist silent film *Metropolis* (Lang, 1927), using MIDI-based orchestral sound resources. *Metropolis* was chosen from within other possibilities, such as *Battleship Potemkin* or *Nosferatu*, not only due to the belief that the film's surreal eerie mood and machine-like characters could be represented well by the Second Viennese School's musical style that I intended to adopt, but also due to a judgment that leitmotivic transformation and use of themes as character links fit into a work so rich with characters' showing subtle psychological states.

I set out to compose an original orchestral score for *Metropolis* with the idea in mind, that film music should contribute to the audience's integration with the drama and reinforcement of dramatic tensions by strategically supporting the film's plot and narrative, and that an agreeable conceptual blending between film and music would be crucial to a successful composition. For this task, a thorough review of the leitmotif and related literature about music semiotics and meanings, together with a brief discussion of the MIDI sampler orchestra, proved to be necessary. *Metropolis*, a pioneering masterpiece of sci-fi, which contains a gloomy portrait of the futuristic world, encouraged me to experiment with the diverse possibilities not only of the leitmotif, but also of kaleidoscopic sound originating from various combinations of virtual instruments of the MIDI sampler orchestra and ultimately to show my musical process.

The document traces the leitmotif as a primary compositional device for thematic manoeuvre in both film composers' scores and major scholars' discussions; it also incorporates current scholarly research about music semiotics and meanings, which has guided choices in each stage of my compositional process. I have revealed how I applied such lessons as Ennio Morricone's microcell technique, Danny Elfman's transformation approaches to thematic material, Howard Shore's reflection of meaning onto music, and Ilan Eshkeri's use of themes as character links to my *Metropolis*. I organized the main character's associate themes using microcell and transformation techniques and contextualised them as character links. For instance, I produced tunes for cold-hearted characters, such as Rotwang, robot Maria, and high buildings, with the twelve-tone technique, poignant dissonances through interval-classes 1 and 6, recursive rhythmic patterns, or their combinations; I also adopted two distinct types of an octatonic scale to describe contrasting personalities of the two characters and a chord based on 2nd intervals to express the moment when Rotwang's evil reaches its zenith. *Metropolis* serves not only as an artistic repository for numerous symbols, but also as a web of leitmotifs towards musical and filmic unity.

Content

Submitted work

***Metropolis* (Lang, 1927)**   1:17:52

List of figures

Introduction

The complete original orchestral score for the classic expressionist silent film *Metropolis* (Lang, 1927) using the MIDI-based orchestral sound resource is the outcome of my musical experience and knowledge, which incorporates ceaseless learning, research, experiment, and contemplation during the academic years at the University of Huddersfield. The process of writing a composition for this film and, more broadly, composing for a film has been realised under the following poetics of music.

Firstly, film music should contribute to the audience's integration to the drama and reinforcement of dramatic tensions by strategically supporting a film's plot and narrative. Although some film-music composers address either music's independence from a film or a balance between the two media, I believe that music should serve as a subordinate to the plot and narrative of the film. Secondly, a composer's choice of music under specific circumstances should be able to lead to a consensus and agreement among the audience about why certain music accompanies a specific passage. In other words, an expectable and agreeable conceptual blending between visual images and music is crucial for a successful composition. In this regard, the leitmotif as a primary compositional device, which relates a film's plot closely to music, and the compositional aids from music semiotics and meanings have served as two primary axes of my *musica poetica* in the process of scoring *Metropolis*.

Metropolis, a pioneering masterpiece of scientific films, which contains a gloomy portrait of the futuristic world, was a perfect choice for me who was inclined to realise the *musica poetica* including the leitmotif, reflection of meanings onto music, and radical experiment with the kaleidoscopic sound, which originates from various combinations of virtual instruments. I selected the film *Metropolis* out of the other candidates such as *Battleship Potemkin* or *Nosferatu*, not only because the Second Viennese School's musical style is more suitable to represent the film's surreal eerie mood and machine-like characters, but also because microcell themes, leitmotivic transformation and use of themes as character links fit well into the work containing characters' subtle psychological changes and a person's two contrasting entities.

The commentary, divided into two chapters, documents a series of my compositional process. While the first chapter introduces my poetic tools that not only influenced the process of my film-music scoring, but also served as a foundation for the composition itself, the second chapter elucidates my compositional intent and techniques as seen in *Metropolis*. In Chapter 1, I trace the leitmotif as a primary compositional device for the thematic manoeuvre in both film-music scores and discussions as seen in primary scholars' books and treatises; furthermore, I explore the current scholarly research on music semiotics and meanings, which has guided my choices in each compositional stage. In addition, I review a history of orchestra sampler, which produces kaleidoscopic orchestral sound arising from various virtual instruments and their combinations. Then, I proceed to illuminate how I espoused and applied valuable lessons from Ennio Morricone's microcell technique, Danny Elfman's transformation approaches to thematic material, Ilan Eshkeri's use of themes as character links, Howard Shore's reflection of meaning onto music, and Morricone's use of iconic music for the protagonist to my *Metropolis*, discussing musical instances from major contemporary film composers.

Chapter 2 focuses specifically on my compositional intent and techniques. It reveals that main character's associate themes were organized using micro-cell and transformation techniques and were contextualised as character links. As concrete examples, I explain as an analyst of my own work why tunes based on a twelve-tone technique, vertical sonority including poignant dissonances such as interval-classes 1 and 6, and recursive rhythmic patterns have been adopted in the work. The commentary will make it clear that *Metropolis* is a comprehensive outcome of emotional training as a composer and logical contemplation as a scholar.

1. Main relevant approaches to film music composition

1.1. Leitmotif as a symbolic device ensuring unity

A *leitmotif* is defined as a short musical theme "created for a film and then developed (varied, reorchestrated) within that film" (Neumeyer, 2015, p. 16). The term was initially used in connection to the musical dramas of a nineteenth-century German composer Richard Wagner "to describe a recurring melody that is associated with a certain character(s), object, place, emotion, or idea" (Ibid, p. 17). A leitmotif retains its identity even if changed during consequent appearances. It "symbolizes a person, object, place, idea, state of mind, or supernatural force or any other ingredients in a dramatic work" (Whittal, 2003). Therefore, a leitmotif has long formed a standard system in the film-music making and was particularly prevalent in Hollywood movies of the 1930s and 1940s by film composers such as Erich Korngold, Max Steiner, and Alfred Newman (Neumeyer, 2015).

In the first section entitled "Prejudices and Bad Habits" of *Forming for the Movies* (1947), Hanns Eisler with Theodor Adorno harshly criticized Hollywood film composers for routine and mechanical use of leitmotifs; they relentlessly pinpointed "over-dependence on scores" in Hollywood music, stating that Hollywood film composers "patched together by means of leitmotifs", perpetually met the necessity of "unobtrusiveness not by an approximation of non-musical sounds but by the use of banal music, and its penchant for clichés . . . [is] associated with the mood and content of the picture" (Adorno & Eisler, pp. 4, 10 & 12).

Despite the negative perspective on the use of leitmotifs, they have however served as a primary compositional device providing a score with unity. As Neumeyer and Buhler put it, "[t]he unity that the leitmotif delivers is somewhat analogous to the melodic/motivic networks of a concert work, except that the film composer can draw on the image-track as a means of motivating the introduction a leitmotif into the musical texture at any given moment" (Neumeyer & Buhler, 2001, p. 29). In the process of defining the leitmotif, Matthew Bribitzer-Stull questions the appropriateness of the term itself (Bribitzer-Stull, 2015, p. 7). He asserts that the new term *associate theme* must substitute the term *leitmotif* for the two reasons: Wagner's

leitmotif is different from the one used by film composers, because the former has unique and sophisticated usages; also, in English-speaking nations, the "motive" indicates an incomplete musical thought and thus is not appropriate for the one designating a larger musical whole containing a complete musical thought.

Overall, leitmotif is associated with filmic elements and has functioned arguably well towards this purpose. Historically, the use of leitmotif has been continuously found in the film music industry. The remainder of this chapter reveals how leitmotif has contributed to the associations with filmic constituents, discussing the mainstream of film music history. I will focus on specific films that have meaningfully used the leitmotif technique in a chronological order.

One cannot deny that Richard Wagner had an enormous influence on the initial stage of the film. His idea of the *Gesamtkunstwerk* (total art work) established a model where music and drama cooperate with each other, and the leitmotif infiltrates into "the model for unifying the accompaniment and clarifying the story" (Kalinak, 2010, p. 46). One could find clear instances of leitmotifs in Wagner's musical drama *Der Ring des Nibelungen* whose storyline is based on Germanic and Scandinavian myths (Buhler & Neumeyer, 2015, pp. 122-123). In the drama, not only characters, such as Loki, Thor and Wotan, but also objects, places and supernatural forces, such as the Ring, the Rhine River and the Sword, all have their own themes. Moreover, there are principal characters, such as Siegfried, who have several leitmotifs. Furthermore, the signification is more complicated than in the movies of the 1930s and 1940s.

The technique of the leitmotif that film composers adopted after Wagner was in a simplified form: it was at best a recurrent occurrence of themes assigned to main characters, such as the main title for the hero or a love theme for the heroine. In terms of the number, film composers usually use only two or three themes, whereas Wagner juggles dozens of motifs across his music dramas. Because of these discrepancies in the way of adoption, some music scholars have suggested, as pointed out earlier, substituting the term leitmotif by the term *associate theme*, the latter being similar to but more simplified in signification than the former. However, recent research explores leitmotifs

through diverse hermeneutic windows and generates multiple latent meanings arising from various musical variations.

In 1910, *Frankenstein* adopted a theme from Carl Maria von Weber's opera *Der Freischütz* and assigned a leitmotif to the monster (Kalinak, 2010, p. 46). Musically, haunting and spooky music in Wolf's Glen scene, which symbolizes the young hero's encounter with a host of demons, has been modelled after the eerie and horrible mood for *Frankenstein*. Its bold orchestrations and audacious harmonies, which overwhelm the musical idiom of the time, were startlingly appropriate for the aural depiction of the haunting mood of the early 20th-century horror movie. As early as in the 1910s, leitmotif was already solidified as a compositional cliché in film music production.

Kathryn Kalinak sees the 1920s as a period of an immense bloom of film scores, enumerating numerous silent films, such as George Antheil's experimental score for *Ballet Mécanique* (1924), Erik Satie's *Entr'acte* (1924), and Gottfried Huppertz's *Metropolis* (1927) (Kalinak, 2010, pp. 48-49). Interestingly enough, Kalinak (2010) takes Satie's *Entr'acte* as one of the most intriguing scores of the era in that Satie intentionally avoided unifying the structure, by dismissing the leitmotif, tonal organization, and musical/narrative form. She describes musical organization of the score as follows:

> Like Clair, who defied the developing conventions of narrative cinema (or tried to), Satie turned his back on conventions of musical accompaniment by undercutting the use of music to respond to the images, avoiding the use of leitmotifs or any unifying structure, confounding clear rhythms, and even resisting tonality itself. For instance, although sections of the score seem nominally to revolve around tonal harmony, it seems to move from the unrelated keys of A major to F major to C major in the opening section, with a striking absence of clear tonic chords to reinforce these keys. There are, in fact, so many unresolved dissonances that whatever chords we do hear are stripped of their function to anchor a stable harmonic system (Kalinak, 2010, pp. 46-47).

By contrast, *Metropolis* (1927) scored by Huppertz is regarded as a work espousing Wagnerian manipulation of leitmotifs and post-Wagnerian adventurous harmonic languages (Cooke, 2008). Binary opposition in character and circumstance marks a contrast in musical organization: two protagonists, Freder and Maria; and two different circumstances, the upper and the under city. Freder's themes below aptly describe positive and

optimistic personality of the character: the major mode, brassy and triumphant tone colour, ascending melodic contour based on triads, austere mood that comes from the dotted rhythmic figure, and mixolydian inflection G^b – all these contribute to the arousal of such moods. On the other hand, Maria's theme is calm and tranquil (not shown). These two contrasting protagonists sometimes compete or cooperate with each other to generate an interesting narrative in music.
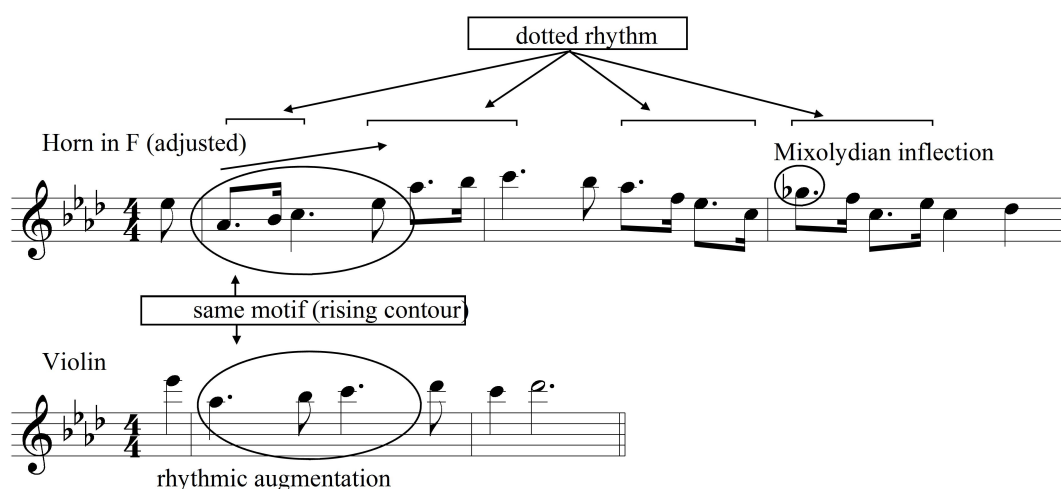
Fig. 1. 1 Freder's themes from *Metropolis* by Huppertz

(analytic annotations mine)

Fig. 1.1 shows the two shapes of Freder's theme belonging to the upper and the under city, respectively. The original theme played by the horn with string accompaniment is heard when Freder appears in the bright upper city, while a short melody played by the violin appears at the meeting between Freder and his subordinate Josephat to solve people's problem in the under city. In addition to the mild tone colour of the violin, augmented rhythmic values, rising the melodic line by step, and the rigid tonal axis from tonic to dominant lead to the sense of relaxation and stability.

The striking growth of audio and video technology had a great influence on film music between 1927 and 1933 (Wierzbicki, 2009, p. 104). Many filmmakers and musicians started to combine visual images and pre-recorded music pieces. This synchronization led to a more delicate and refined

reworking of leitmotifs. Musical numbers were assigned to small portions of silent films, accompanied by a recorded symphonic score, and thus allowed for a syncronization of recorded sound with on-screen activity. Three films produced by what we could call a *Mickey Mousing* technique were *The Jazz Singer* (1927), *Don Juan* and *The Better 'Ole* (both 1926). Since then, the advanced technology, which evokes an exact synchronization of audio and video, has been adopted in many films, including those by Charlie Chaplin and Disney.

In 1933, Steiner refined and maximized the effect of *Mickey Mousing* in *King Kong* by drastically controlling musical tempi according to the tribal leader's feet (Cooke, 2008, p. 89). The listener can easily recognize the conductor's endeavours to manipulate the music for a synchronization with the on-screen characters' flighty tread. Wierzbicki (2009) lively describes how reporters of the time praised Steiner's scoring for King Kong, quoting the composer's interviews and newspaper's accounts (Ibid., pp. 129-130). *The Los Angeles Times,* published prior to the film's release (1933), highly evaluated Steiner not only because the music for *King Kong* "proved the most difficult job" Steiner "ever tackled", but also because Steiner's music "jibe[s] with the unusual sounds made by the [film's] weird animals", whereas Steiner himself recalled that he required a completely "new technique in score and synchronization" (pp. 129-130).

Steiner's handling of the leitmotif is quite noticeable. Steiner allowed Kong's chromatic leitmotif to repeat through the film at appropriate moments, achieving tightly-knit connections between the story and the music. Wherever Kong appears, Kong's leitmotif is heard from the screen. This became practicable because Steiner limited it to only three notes. This brief three-note motive permitted him to use it readily at any intended places and contexts by appearing sometimes either as a digetic or as a nondigetic cue. For example, at one point, it attacks a diegetic prompt and, at its peak, converges with the love theme as Kong is compelled to part from his love (Cooke, 2008, p. 89).

Another fascinating instance of the leitmotif is found in Korngold's score for *The Adventures of Robin Hood* (1938) where late-medieval music "English balladry" was woven into a romantic artwork (Kalinak, 2010, pp. 63-64). The contrast between characters is reflected in music and leads to a narrative in

music. King Richard's leitmotif, which represents England itself, is heard first firmly in the key of E♭ major; it then goes through a series of transformations, fluctuating between major and minor keys and modes; and, finally, it comes back to the home key with King Richard's return home. On the other hand, the detestable character 'Guy of Gisbourne' takes unstable ascending intervals of major sevenths and minor ninths as his leitmotif and then floats aimlessly. What we could call "motivic manipulation between leitmotifs" is more intriguing. Kalinak (2010) describes the interaction between leitmotifs as follows:

> Leitmotifs also connect the characters to each other in interesting ways. The leitmotif for Robin and Marian, which functions as their love theme, grows out of King Richard's leitmotif (they share an opening ascending fifth), suggesting that Robin and Marian's love of king and country is what brings them together (p. 63).

Mervyn Cooke aptly describes the style of film music in the 1930s and 1940s, paying attention to the influence from the concert music (symphonic music and opera) that was out of date for a few decades. He points out that the symphonic sound and romanticism based on a more or less mild tonality has been established as a norm, whereas more modern trials, such as "jazz, extreme chromaticism or atmospheric harmonies and suggestive instrumentation borrowed from more modern French impressionist writers" began to be perceived as an exotic deviation for film composers and moviegoers (Cooke, 2008, p. 78). The audience's strong obsession to memorable and singing melody in film music led to favouring "a leitmotif-oriented tonal language" and conservative harmonic language, as compared to that of concert music of the time.

The 1950s mark a drastic change in the film music style. It is the revival of a new style, which deviates from the orchestral symphonic sound based on tonal romanticism. "Though music in the traditional style of film commonly holds to specific standards, since the 1950s, various film scores have performed traditional style narrative functions not with purely orchestral music, but rather with music composed informally for more eccentric media as solo piano, electronic instruments, and jazz groups" (Wierzbicki, 2009, p. 5). Such a change led to the French 'New Wave' and Italian 'neo-realist' developments that involve much diegetic music and less dependence on

leitmotifs. It is related to the influx of the pre-existing popular songs into film music of the time, on the one hand, and to the engagement with modern musical experiments, on the other hand. For instance, whimsical rhythms, unusual instrumentation, atonal sonority and, at times, noise of modernism were prevalent in Leonard Rosenman's scores for *East of Eden* (1955) and *Rebel Without a Cause* (1955), as well as in Leonard Bernstein's score for *On the Waterfront* (1954) (Kalinak, 2010, p. 68). Such modernistic tendency in film music since 1950s reached its culmination in the scores that Bernard Herrmann composed for Alfred Hitchcock; for example, the all-string gathering for *Psycho* (1960), the all-metal troupe for *Torn Curtain* (1966), the habanera from *Vertigo* (1958), and the fandango from *North by Northwest* (1950) reveal striking instrumentation.

Alongside with the invasion of modernism, twelve-tone serialism made its imprint during the mid-century. One can hear it in Rosenman's score for *The Cobweb* (1955) and in Scott Bradley's scores for the MGM *Tom and Jerry Kids' Show* (Kalinak, 2010, p. 69). On the other hand, Louis and Bebe Barron used cybernetic technology to create the electronic score to *Forbidden Planet* (1956), which signified a watershed movement for non-orchestral scoring. What they called 'electronic tonalities' replaced instrumental leitmotifs with electronic sound effects.

Two different tendencies coexist in film music composition of the 1960s. Although Hollywood tended to develop new musical vocabularies that had been discovered a decade ago, there was, due to larger production budgets, an obvious comeback to romanticism based on the full orchestra (Kalinak, 2010, p. 72). Movies that clung to this traditional model include *Lawrence of Arabia* (1962) and *Doctor Zhivago* (1963) scored by Maurice Jarre. The ceaseless preference of the romantic idiom coloured by kaleidoscopic symphonic sounds remained intact in the late-1970s and mid-1980s by prolific composers such as John Williams, John Barry, and Howard Shore; most successful scores include Williams's *Star Wars* series (1977–83), Barry's *Out of Africa* (1985) and *Dances with Wolves* (1990), and Shore's *The Lord of the Rings* series (2001–03).

In the meantime, the powerful impact of Stravinsky's cacophonous early Russian style infiltrated into Jerry Goldsmith's work, as is evident in such

scores as *The Planet of the Apes* (1968), one of the more enduring sci-fi franchises of the era. In fact, three of Smith's best films were coordinated with the director Franklin J. Schaffner, with whom he took a shot with *The Planet of the Apes*. Goldsmith was particularly noted for his trials with instrumental sound. In his score for *Alien* (1979), he used a shofar (a ram's horn used in Jewish worship services), a steel drum, and a serpent (a large, curved bass cornet). While favouring a full symphonic orchestra where conceivable, he also used new electronic instruments in conjunction with ethnic instruments.

Diverse instrumentation balances between acoustic and electronic media in Goldsmith's score for *The Planet of the Apes* though electronics in music were not yet commonplace. In the 'hunt scene' of the film, the apes ride armed on horseback, chasing a group of stranded people. Goldsmith uses an assortment of gadgets to stress the feeling of dread, including unusual instruments and conspicuous adoption of percussion. The use of unconventional ethnic instruments, such as a ram's horn and a Tibetan horn, signify the primitive/extraordinary aspects of the apes. Percussion incorporates ethnic instruments, such as boo-bams, while electronic instruments include an electric harp and an electric bass clarinet. Dissonance is also used for the film, as the 'harmony' is actually inharmonious through a large portion of the composition; for example, the opening harmony on beat 2 of bar 1 has an A from the viola conflicting against a B$^\flat$ from the cello.

The evasion of conventional tonality with hints of serialism is also present in the film. The music is not tonal, although tonal centricity obviously exists. The score for *The Planet of the Apes* anchors a tonal centre C that frequently returns towards the beginning of bars, often as an articulated pedal (bars 1-4) (Fig. 1. 2). The piece gradually develops from various short, fragmentary ideas, the majority of which do not last more than a single bar. As shown below (Fig. 1.2), the opening theme comprises only five notes. Note the rising semitone followed by a jump of a tritone.
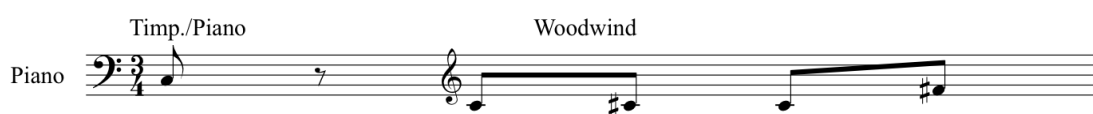
Fig. 1. 2 Opening theme, *The Planet of the Apes,* bar 1

The second motif by the piano, bar 4, which originates from the principle theme, unites wide jumps with semitones, but drives back to the beginning note C. In serialist fashion, the theme consisting of fragmentary motifs finally envelops all the twelve chromatic notes up to bars 8-9.
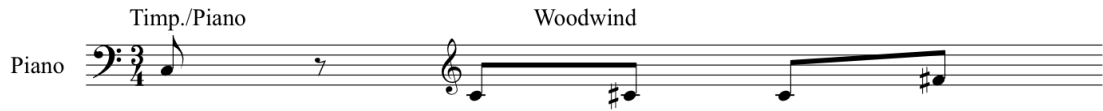
Fig. 1. 3 Second motif, *The Planet of the Apes,* bar 8

The following principal ideas get together: the sustained violin note starting at bar 11 prompts an uproarious discord and a succession of three quick notes (C–E^b–D), which is a rising minor third and a falling semitone. The theme is a precise inversion of the initial three-note figure of the film's music. The figure is then changed twice. In bars 17-18, there is a free reversal (i.e. a falling major second followed by a falling major sixth); then, in bars 21-22, it is transformed into a triplet figure with an additional note included at the front and transposed up to a perfect fourth. At bar 23, the riff is heard in oboe, clarinet, and harp in E level, the long-note theme is heard in trombones, and the bass line is a retrograde of the 12-note sequence heard in bars 8-9 (Fitzgerald & Hayward, 2013, p. 34). Goldsmith's way of handling the 12-tone is quite noticeable, because it has its own way of systematizing 12 notes, which is different from that of concert music composers.

Morricone's debut was a remarkable event in the late 1960s. As indicated by Robert C. Cumbow, Morricone did not compose music with the leitmotif in the 'theme' sense, as did other film music composers under the Wagnerian influence, such as Williams, Bernstein, and others. Cumbow stated that Morricone's music is "more songlike than recitative—tapping, not surprisingly, the Italian, not German, operatic tradition and running to the repetition of melodic set-pieces rather than the comingling of themes or to the purely atmospheric commentary of most film scores" (Leinberger, 2004, p. 18). However, this does not mean that Morricone always avoided using the leitmotif; rather it implies that he advanced the use of the technique to appropriate moviegoer's taste. Morricone's methodology gives music the ability to do more than just to go with a film with the leitmotif. His penchant

for using the leitmotif in his own way is represented in an interview with Harlan Kennedy of *American Film* magazine in 1991: "Music in a film must not add emphasis but must give more body and depth to the story, to the characters, to the language that the director has chosen. It must, therefore, say all that the dialogue, images, effects, etc., cannot say" (p. 19).

Thus far, I have surveyed a concise history of film music from its initial stage to Morricone through film-music scholars' perspectives, with a particular focus on diverse uses of leitmotif. This historic overview reveals that leitmotif was a necessary choice for film composers to closely relate their music to story components vital to the film's plot and, finally, to catch the audience's attention. Although some film composers warned and avoided overusing the leitmotif technique, numerous composers embraced, appropriated, and refined it as a device that touches the audience's psychology. In orchestral music, themes and leitmotifs can gain significance when they involve timbral qualities. In the next step of the research, I will discuss orchestral techniques, which inspired my own compositional process, as seen in several important film composers.

1.2. Compositional guides obtained from recent scholarly contribution

1.2.1. Semiotic, metaphoric, and cognitive approach

Although my mission is essentially practical, I have tried to prepare myself with academic background through reading that enriches my *musica poetica*. Firstly, I studied music semiotics specifically through Philip Tagg's recent research, which led me to mentally envision the task of scoring for specific emotions (Tagg, 2006, pp. 243, 252).

Secondly, I explored the metaphoric use of music, as discussed by Lawrence Zbikowski (2008) who states that, if metaphor is taken away from music, music remains only with sound (p. 505). Chattah (2006) also discusses iconic metaphors to settle upon basic musical identifications. His discussion is quite similar to how music represents movement as found in Tagg's idea of 'anaphones'.

As Neumeyer said, "Music can reflect emotion and create atmosphere through conventions" inspired me to study conventional music in depth and explore common-practice language and idioms latent in it (Neumeyer, 1990, p. 15). Even specific characters or situations have interacted with conventional sound (Sadoff, 2006, p. 174). This output prompted me to study how music is associated with emotion and how it can express atmospheres (including actions in films). *Pirates of the Caribbean* (Verbinski, 2003-2007), *The Lord of the Rings* (Jackson, 2001-2003) and the *Star Wars* film series (George Lucas, 1977-2001) encompass rich conventional musical expressions that inspired me to apply the musical features to my music.

Thirdly, the cognitive approach to human emotional states gave me fresh ideas by which I decide to compose. Juslin (2010) presents a myriad of relationships between sound and emotion which displays the emotional change according to the acoustic cue (Fig. 1. 4b). While Juslin (2010) spun Russell's model (1991) and concretized it in detail (Fig. 1. 4 a), these myriads indicate the same point (Spitzer, 2011, p. 152). Spitzer presented human emotions that express through musical devices by adopting the persona theory to understand intervention, gesturing, acting, feeling, perceiving and thinking (p. 154). Using this model in his article, he analysed Schubert's string quartet

in G major, Op. 161. His analysis demonstrates how emotion is changed depending on musical cues in the model (Fig. 1. 4 b) (pp. 154-160). Taken together, the abovementioned research of human emotion and its reflection on music affected my sketch of orchestration and arrangement.

Alongside with this exploration, in order to understand how music and film interact with each other, I investigated Parke's experiment (2007, pp. 10-17). He used Thayer's two-dimensional emotion space model (Fig. 1. 16 c) to compare emotions when music is played alone, when a film remains alone, and in the combination of the two. I was intrigued by the fact that the two media cooperate with and reinforce each other to convey emotions.

Alarmed .   . Excited
        Aroused .   . Astonished
Afraid .   . Delighted

Tense .
        Angry .
Distressed .   . Glad
    Annoyed .   . Happy
Frustrated .   . Pleased

                      . Satisfied
Miserable .   . Content
    Depressed .   . Serene
        Sad .   . Calm
    Gloomy .   . At Ease
        Bored .   . Relaxed
        Droopy .
            . Tired   . Sleepy
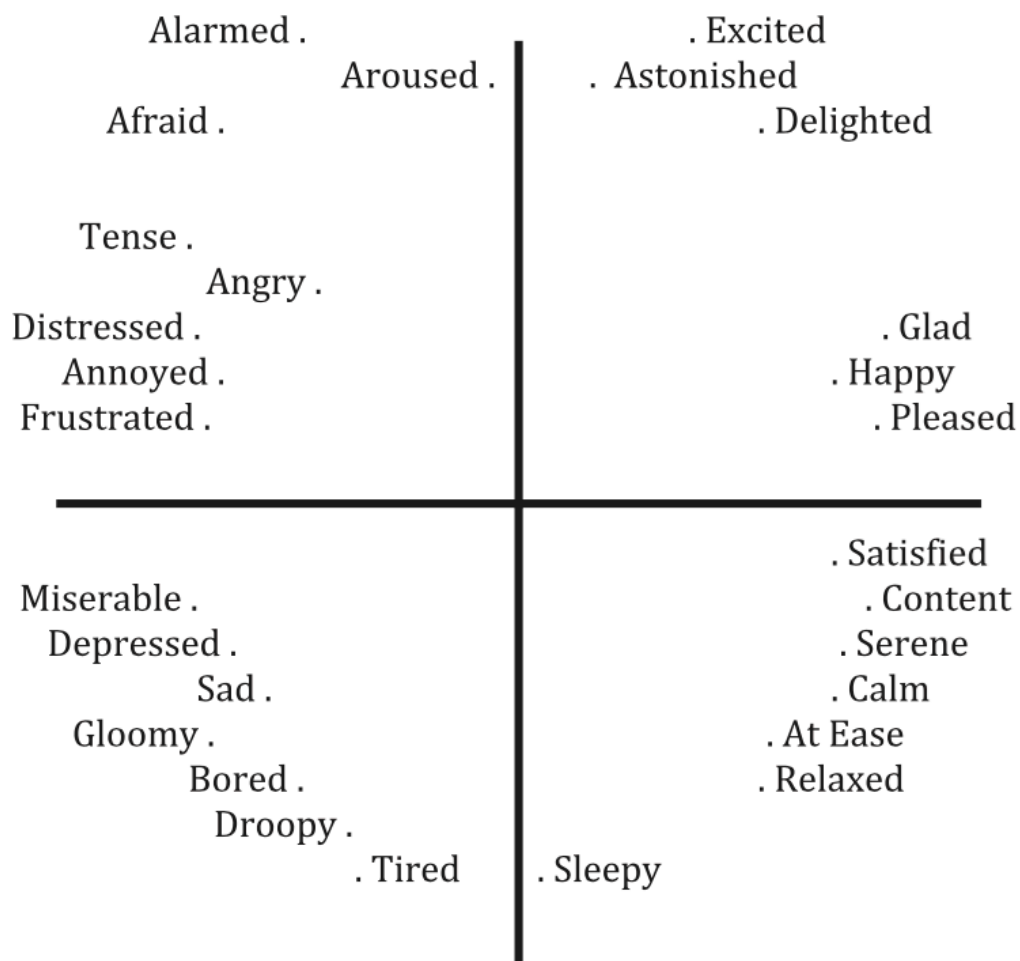
a) Russell's direct circular scaling of coordinates for 28 affect words (1980, p. 1167)

Positive valence

HAPPINESS

fast mean tempo
small tempo variability
staccato articulation
large articulation variability
high sound level
little sound level variability
bright timbre
fast tone attacks
small timing variations
sharp duration contrasts
rising microintonation

TENDERNESS

slow mean tempo
slow tone attacks
low sound level
small sound level variability
legato articulation
soft timbre
large timing variations
accents on stable notes
soft duration contrasts
final retardando

Low activation → High activation

ANGER

high sound level
sharp timbre
spectral noise
fast mean tempo
small tempo variability
staccato articulation
abrupt tone attacks
sharp duration contrasts
accents on unstable notes
large vibrato extent
no ritardando

SADNESS

slow mean tempo
legato articulation
small articulation variability
low sound level
dull timbre
large timing variations
soft duration contrasts
slow tone attacks
flat microintonation
slow vibrato
final ritardando

FEAR

staccato articulation
very low sound level
large sound level variability
fast mean tempo
large tempo variability
large timing variations
soft spectrum
sharp microintonation
fast, shallow, irregular vibrato

Negative valence

b) Juslin-Russel model (2010, p. 611)

c) Thayer's two-dimensional emotion space model (1989, p. 117)

Fig. 1. 4 Graphs for emotions

Cohen's research inspired me to link the speed of behaviour in the scene to music's tempo (Cohen, 2005, pp. 19-24). His experiment concerns how tempo and pitch affects the speed or height of a bouncing ball, providing clues on how to apply pitch or tempo to link movements in a scene.

15

Tagg (2011) analysed an excerpt from *The Mission* (Joffé, 1986), examining how musical instruments are chosen to express certain emotions in the scene. I selected some scenes from *The Lord of Rings, Pirates of the Caribbean* and *Lawrence of Arabia* (Lean, 1966) and analysed them by incorporating graphic scores based on the Juslin-Russell Model (see Appendix A). In the analysing process, I focused mainly on following four aspects:

- Different articulation of the instruments to represent various situations and emotions
- Various changes in the frequency of the strings to express high and low activity
- Changes in combination and articulation of the brass to convey a variety of emotions
- Use of percussions to arouse various atmospheres.

1.2.2. Acoustic and psychoacoustic approach

I examined the sound properties of orchestral instruments to figure out which instrument having which waveform better suits to express the calm mood (Fig. 1. 5). Instruments with a less harmonic content proved calmer; conversely, instruments with richer timbres, like strings, are more appropriate to depict an energetic movement.
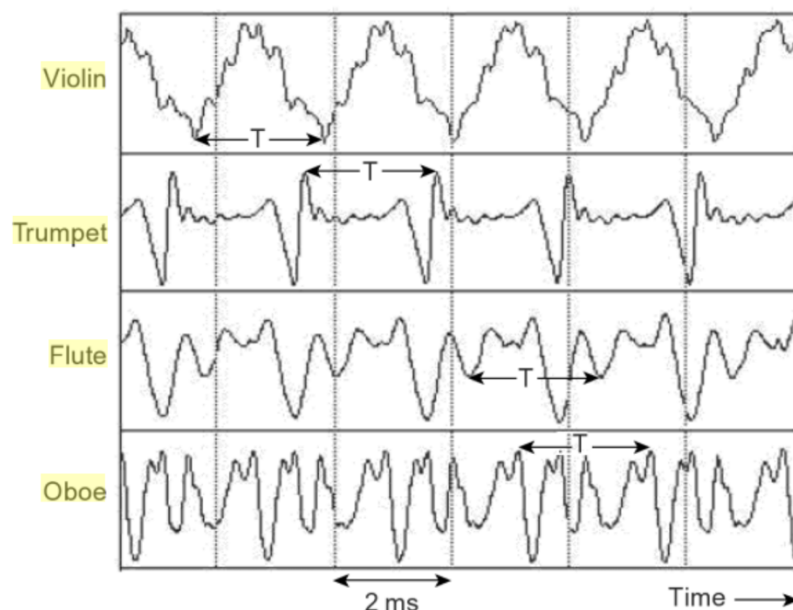
Fig. 1. 5 Acoustic pressure waveforms of A440Hz (A4)

Chattah's (2006) discussion of onomatopoeia in terms of musical representation fascinated me, because onomatopoeia helps composers to represent visual elements through audible cues (Ibid., p. 122). I also studied Jürgen Meyer's (2009) vowel sounds applied to instrumental choices (p. 71) (Fig. 1. 6). All these studies served as solid bases for my composition.
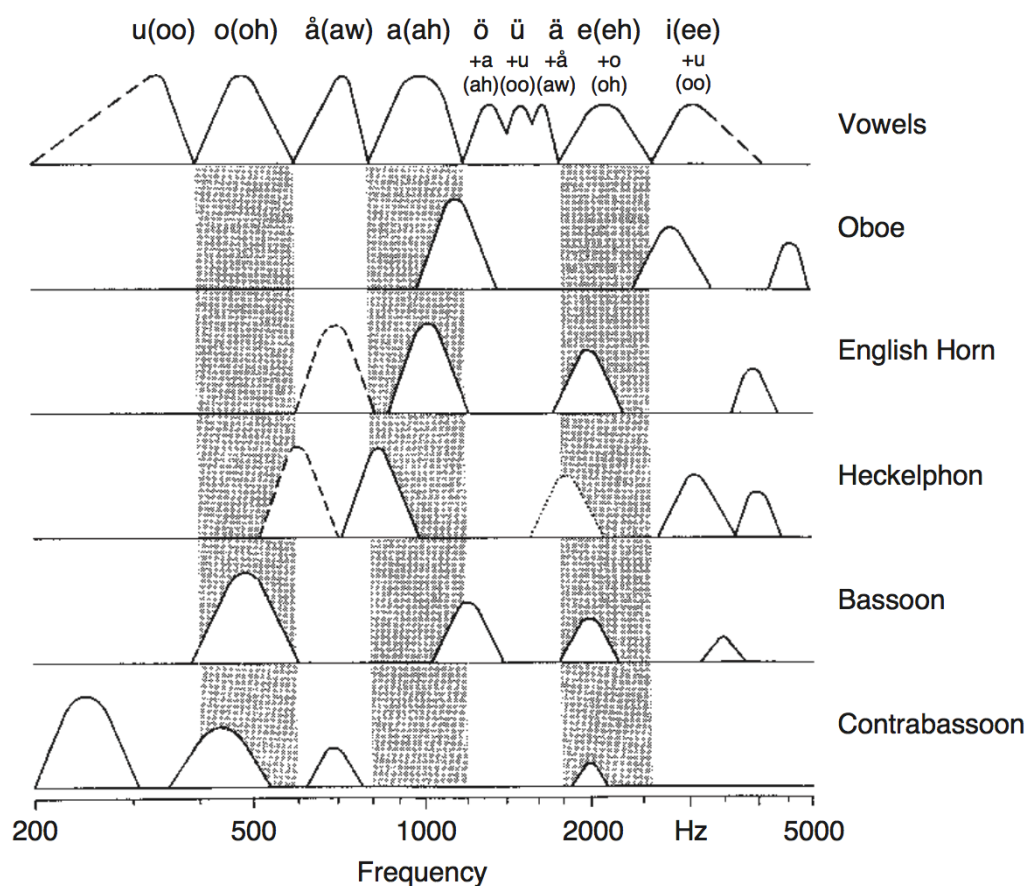
Fig. 1. 6 Schematic representation of formant locations for double-reed instruments (Myer, 2009, p. 71)

1.3. The MIDI sample orchestra

From the late 1990s into the twenty-first century, technology has influenced the methods used by film composers with the developments in sound technology, computer software and equipment, enabling the evolution of the musician's range of scoring (Sapiro, 2013, p. 16). Since the 1970s, music technology has also allowed them to preserve or store sounds in electronic formats. In 1975, Yamaha released the GX1 which had a storage slot (Stewart, 2000, SOS[1]), one of the first instruments capable of keeping the sound presets. In 1976, New England Digital Corporation (NED) introduced Synclavier, the first synthesizer with all digital sound generation. In 1979, the Fairlight CMI was the first commercially digital sampling instrument without producing sounds from controlling wave data. The Synclavier and Fairlight were the most updated instruments until the complex digital synthesisers, such as Mirage (1986), Emu Systems 'Emulator' and AKAI's S1000, appeared in the world (Bosi., N.T., p. 148).

In 1990, the American software company Nemey released Gigastudio, reducing the need for expensive hardware like the Fairlight or the Synclavier through virtual instruments with sound samples (Sapiro, 2011, p. 261). By 2005, EX24 or EX24p, the sampler that comes with Apple's Logic Pro software, was already capable of efficiently replicating orchestral sound (White, 2005, SOS[1]). In 2008, Kontakt, a sampler from Native Instruments, was used to create the score for *Avatar* (Cameron, 2008; Sapiro, 2011, p. 262). Simon Franglen, the musical arranger for this film, stated that Kontakt gave him the ability to create and customize sounds in a way that no other sampler could achieve, and that Kontakt was therefore central to his work for the film *Avatar* (Sapiro, 2011, p. 262). Wit hteh development of the software, orchestral samplers have increased in quality and can now make mock-ups with orchestral samples before recording a real orchestra (Gerber, 2005, p. 2). Hans Zimmer wished to stretch the use of music technology further and started producing very realistic-sounding orchestral mock-ups (Wherry, 2007). This technique enables producers and directors to more fully understand the intention of composers (Karlin, 2004, p. 101).

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[1] Soundonsound.com

Orchestral samplers are also used for replacing real orchestral sound, as can often be heard in Videogame and TV projects. For example, Joris de Man used orchestral samplers for *Killzone: Liberation* (2006) and stated that he had to make more effort to achieve a more realistic sound with samplers (Greening, 2010). Richard Beddow also created high-quality mock-ups for composing game music, such as *Harry Potter,* when he had to work within a small budget or did not have sufficient time to create orchestral music through an orchestra recording. Financial issues are usually the reason for creating a MIDI mock-up, as it saves time and money (Karlin, 2004, p. 426).

There are musicians who simply do not agree with the idea of totally replacing orchestral sound with orchestral samplers. Laura Karpman, a composer of *Taken,* does not use a totally synthesized orchestra (Karpman, 2002), but instead favours creating a string orchestra overdub (Karlin, 2004, p. 428)

Composer Jay Asher stated that, when he composed music for *Zorro* (TV series, 1990-2001) with an orchestral sampler, he agonized over what to use for the final product and decided to use 'good' sounds from an advanced sampler, rather than 'real' sounds performed by an orchestra. Such a decision sometimes leads to the use of a plethora of instruments, whereas an orchestra usually has four to eight French horns; in a mock-up, one could use eighteen French horns! Asher did not have any regard for the number of virtual instruments in order to achieve a good sound (Asher, 2010). Subsequently, it has become apparent to me that samplers can provide inspiration and produce good sound. Moreover, it is sometimes efficient for film composers to work with samplers in order to be creative in a short time, as in the cases when they are under the pressure of a timescale (Wherry, 2007).

While the evolution of samplers enables composers to use high-quality sounds that increase their ability and musical scope of musicians, it cannot replace a live performance of an orchestra. However, I would suggest that, when using orchestral samplers for background music, it is possible to efficiently replicate the sound of a real orchestra in composing orchestral music for films.

1.4. Compositional techniques as seen in primary film-music repertoires

In the history of film music, four composers, both directly and indirectly, inspired my compositional voice. They are Ennio Morricone, Danny Elfman, Howard Shore and Ilan Eshkeri. These composers have all been significant to my own scoring strategy for the following aspects: Morricone for the microcell technique and the iconic theme design appropriate for characters; Elfman for the economical use of thematic material; Shore for the adoption of themes that contain social and cultural meaning; and Eshkeri for the thematic manipulation as character links. Their individual techniques offer attractive expressions and possibilities, all of which have influenced certain decisions and considerations during my scoring process. As is customary in film music, I have borrowed their views and techniques and tried to synthesize them into a more polished entity. In the following subchapters, I will point out specific passages excerpted from their work that inspired me with certain ideas and then explicate what influences and how the pieces gave me.

1.4.1. Morricone's micro-cell technique

Morricone is famous for writing a beautiful melody that is not easily forgotten in listeners. He has displayed full of lyricism in 'Gabriel's Oboe' of the well-known film, *The Mission* (Joffë, 1986). In *The Mission,* the oboe tune accompanied by other woodwinds contributes to the arousal of quietness and calmness. Fascinated by 'Gabriel's Oboe', I devoted considerable time to research his music pieces, including *Nuovo Cinema Paradiso* and *Malèna* (Tornatore, 1988 and 2000), paying attention to how he evoked listeners' emotions. I realized that a strong sense of melancholy comes from a trustworthy balance between a singing melody and its harmonic support.

In addition to Morricone's mastery of writing a melody, what fascinated me in his music was the *microcell technique*, a way of creating a theme with short fragmentary motifs. Morricone has used this technique in *The Good, The Bad and The Ugly* (Leone, 1966). It is intriguing that the micro-cell technique combines with his peculiar concept of the leitmotif: several short motives fragmented from a theme, assigned to different individual instruments, are

organised to represent the main characters (Leinberg, 2004, p. 80). The main title flows for the first time over a long and thrilling scene where three men gradually approached a cantina in a ghost-like town.

Fig. 1. 7 is the main title excerpted from *The Good, The Bad and The Ugly* with the analytic annotation by Charles Leinberger (2004). The main title is sorted out into eight short motivic fragments. What Leinberger labels Motive 1A appears periodically at two bars, achieving the status as a primary gesture. Motives following Motive 1 connect seamlessly to the subsequent occurrences of the primary motive. A close examination of the motives reveals that they are very closely related to each other to achieve a high level of intervallic unity. Notice the perfect fourths that are embedded in each motive.
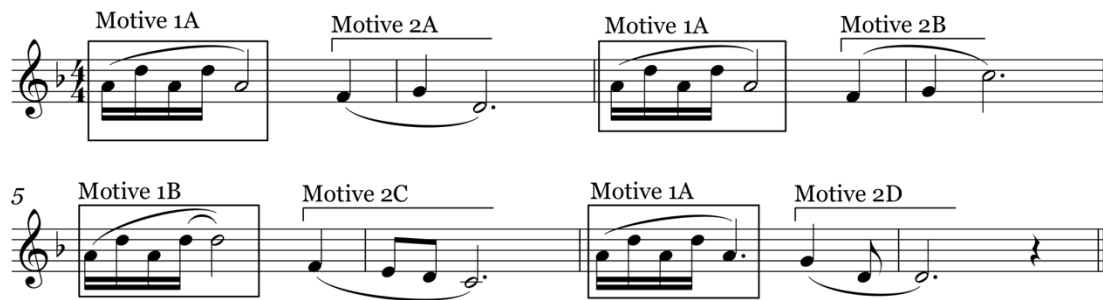

Fig. 1. 7 Ennio Morricone, *The Good, The Bad and The Ugly*, bars 1-8
(after Leinberger, 2004, p. 80)

Every two-bar unit represents three protagonists: each of the protagonists' motives takes different instrumentations. The soprano recorder represents the character known as Blondie (The Good), two electronically treated male voices represent Tuco (The Ugly), and the bass ocarina represents Angel Eyes (The Bad) (Leinberger, 2004, p. 78). With regard to this treatment, Jeff Smith points out that "[a]s every title shows up, there is a stop outline under which the fundamental musical idea plays as sort of leitmotif" (p. 82). This is the important moment where Morricone is different from Wagner. Unlike Wagner who assigned different themes (leitmotifs) to every character, Morricone had three primary characters, Blondie, Angel Eyes, and Tuco, heard through diverse instrumentation of the single leitmotif (p. 82).

Miceli (2004) calls Morricone's microcell technique 'pseudo-serial', because it resembles serialism in terms of its systematic procedure, though

not atonal; it does not follow the same rules technically as strict serialism (Leinberger, 2004, pp. 11-12). The technique allows for repeating or transposing notes, expanding the interval of notes, reordering notes, and even filling in the gap in-between the fixed notes. As a result, there are no rules for ordering the fixed notes in a frequently heard melody.

In the process of espousing and applying Morricone's microcells to my *Metropolis*, I added my own inspirations to the technique: Schoenberg's delicate manipulation of handling a three-note pitch-class set (014) inspired me as seen in the pre-serial work, *Drei Klavierstücke* Op. 11 (1909). My composing with microcells espoused the systematic and analytic approach to post-tonal music (Forte 1973, Kostka 1991, Straus 2004).

In my *Metropolis*, I adopted Morricone's microcell technique, particularly for an early scene where the workers laboured like slaves (00:01:18). The pitch-class set that I chose is the SC 3-5 whose prime form is (016). It consists exclusively of interval classes 1 and 6. Successive transposition of the pitch-class set allows the same intervallic pattern to repeatedly occur in slightly different spaces; it then helps attain unity in sonority.

I created another melody for Fredersen (leader of the city and father of the main character in the film, Freder) by means of the pitch-class set theory, but in a slightly different way: I began with the same intervallic content (016), but this time involved different interval classes, 2 and 5. In spite of different rhythmic shapes of both themes, a similar intervallic unity is achieved by adopting the same set class (016) at both beginnings of the melodies leads to symbolic meaning of how the workers are dependent on Fredersen for their existence.

Fig. 1. 8 is the original melodic line; it simultaneously represents 'hard work' and theme 2 of 'workers at work'. In the melody, I used two fixed interval classes, 2 and 6. Here my way of organizing melodies differs from that of Morricone. Although he used the microcell technique by fixing notes, I fixed two different intervals, thus allowing for a transposition, but still opening the capacity to appear in any order. Thus, these two intervals pose potentials for a subsequent melodic expansion. By expanding the intervals in longer rhythmic values, I tried to express Fredersen's cold and calm

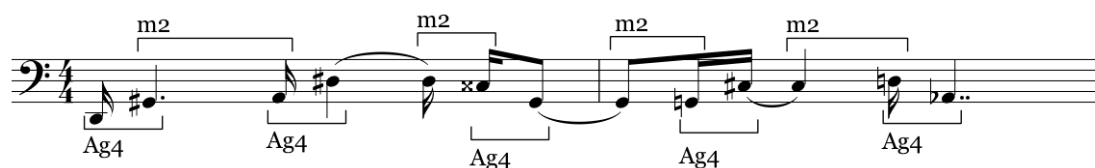personality, because interval classes 2 and 5 tend to be more consonant than classes 1 and 6 (Fig. 1. 9).

Fig. 1. 8 Workers' theme 2 from my *Metropolis,* No. 6, bars 1-2
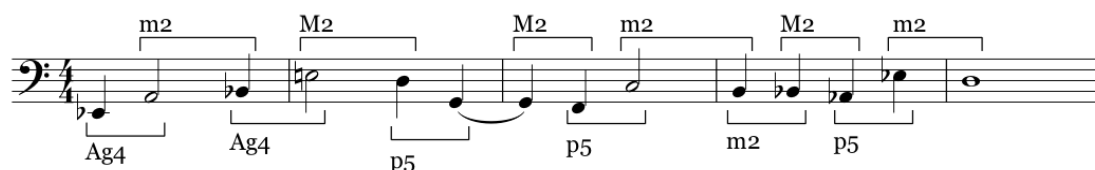
Fig. 1. 9 Fredersen theme from my *Metropolis,* No. 7, bars 18-22

1.4.2. Elfman's transformation of thematic material

After the success of *Batman,* director Tim Burton and composer Danny Elfman became major figures in cinema (Halfyard 2004, p. 1). Elfman is also famous for such film music as *Edward Scissorhands* (1990), *Men in Black* (2001), *Spiderman* (2001) and *Hulk* (2003). I was interested in Elfman's skilful ways of transforming a theme and adjusting it for specific situations (Fig. 1. 10 a). In the main theme of his *Batman* (1989), I discovered that Elfman deliberately avoided the direct tonic-dominant relationship by means of a passing tone and appoggiatura to efficiently represent the heroic mood (Halfyard, 2004, p. 117).

a) Bat-theme, bars 4-7

b) Denied dominant tail, bars 9-10

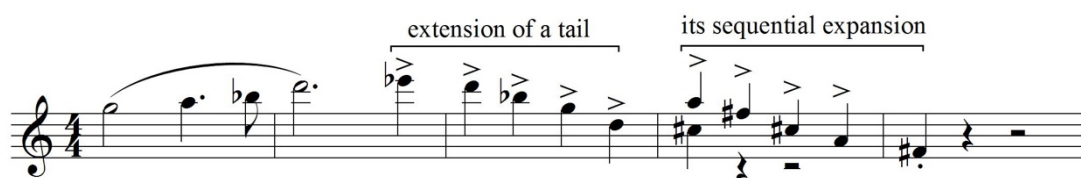c) Modulation to falling major second, sharpened sixth tail, bars 19-20

d) Modulation to falling minor second, arpeggiated, bars 24-28

Fig. 1. 10 *Batman* theme and tranformed melodies

(after Halfyard, additional annotations mine)

Interestingly enough, what Halfyard calls 'tails' leads to modulations to different keys to appropriate the transformed themes for various scenes (Fig. 1. 10 b-d). The tonic-to-dominant axis has been broken bacause of the tail to the dominant E#; the theme readily modulates to A minor, major second lower, because of the tail to the dominant G# that functions as a leading tone of the new key; and, finally, the theme readily modulates to f# minor, minor second lower, because of the sequential progression which began with the tail Eb (Halfyard, 2004, p. 103).

In my *Metropolis,* Freder is a heroic protagonist. I assigned a heroic theme and many transformed versions to Freder's appearances to express his kaleidoscopic character. To generate various transformations from a single theme, I intensively explored harmonic transformations, as well as rhythmic variations. This is different from Elfman who treated his themes by means of

rhythmic variation. The following melodies demonstrate how I handled the thematic transformation and Elfman's tail technique for Freder in various situations.

The following Freder theme (Fig. 1. 11) consists of a two-bar motif followed by the other two-bar tail. Like Elfman, I have set up a dominant-to-tonic axis (A to D) and filled in the space with other notes to embellish the dominant-to-tonic axis. The unambiguous melodic structure based on the dominant-to-tonic axis with a filled-in third assigns to the theme the heroic character by outlining a major triad. The following two-bar tail is associated with Freder's innocent character and finishes with the tonic to create stability.

Fig. 1. 11 Freder's theme, *Metropolis,* No. 3, bars 7-10

Fig. 1. 12 is a first variation of Freder's theme. The tune has been rhythmically augmented to represent the slowdown. This melody also hears in a lower register than the original one: chromatic inflection added to the tail potentially arouses a negative feeling.

Fig. 1. 12 Variation 3 on Freder theme, *Metropolis,* No. 6, bars 70-72

The following melody (Fig. 1. 13) has been transposed, shrunken from the original theme (Fig. 1. 11). It might sound as if C minor, but its tail ends with A. By adding the unexpected note to the end, I deliberately created an aura of Freder's disappointment in the scene where he is talking to his father.

Fig. 1. 13 Variation 5 on Freder's theme, *Metropolis,* No. 8, bars 34-36

1.4.3. Eshkeri's handling of themes as character links

Ilan Eshkeri is well known for his skills in music technology and acoustic composition. He developed his expertise by assisting film composer Edward Shearmur on projects including *Remember Me* (1996) and *The Wings of the Dove* (1997).

Eshkeri composed music for the film *Stardust* (Vaughn, 2007), which was possibly influenced by *Star Wars* in that both works adopted a Wagnerian 'web of leitmotif' (Paulus, 2000, p. 181). Paulus (2000) argues that Williams's force theme stands for a good side. On the other hand, Sapiro (2013) shows how the musical themes influenced all characters, whether they are good or evil in Eshkeri's *Stardust*. Fig. 1. 14 is excepted from his analysis that shows the relation between the themes and characters in *Stardust*.
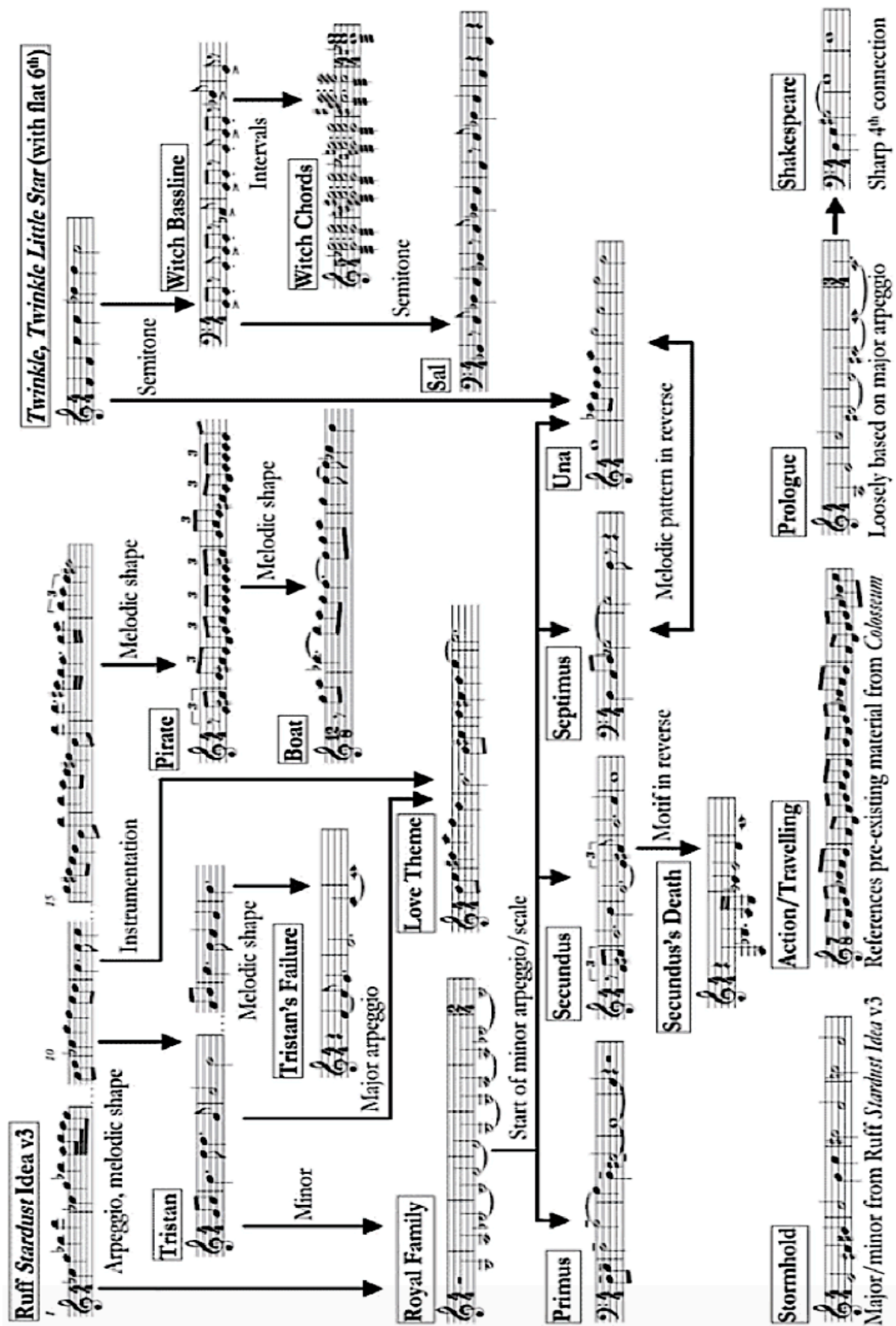
Fig. 1. 14 The web of leitmotifs for Eshkeri's score to *Stardust*

(Sapiro, 2013, p. 112)

Similarly to the ways in which Eshkeri derived tight connections between themes and characters, I presented three short themes closely connected to the characters in *Metropolis*, assigning to each theme specific meanings. Fig. 1. 15 is a genealogy that shows the interrelationships among the themes of *Metropolis*. The first three ideas feature (a) dotted rhythms, (b) a twelve-tone symmetry (inspired by Perle & Antokoletz), and (c) specific interval classes 1 and 6.

Firstly, I used dotted rhythms to express a sense of hobbling, because their offbeat property, which deviates from the regular downbeat pulse, creates an unstable feeling in the melody. In *Metropolis,* dotted rhythms in an otherwise even metre represent the frailty of the characters. Secondly, the twelve-tone tune assigned to Maria contributes to the sense of symmetry. A symmetrical sequence of notes as seen in Maria's tune leads to a centralisation, suggesting a connotation that Maria is at the centre of the story. I also thought that logical aspects of the twelve-tone method correspond well to the mechanical image of robot Maria. Finally, I have adopted a sequence of a tritone and minor second that sound very dissonant and poignant to create tension; I sometimes purposely either sustained or used in a successive way the chords consisting of the two unstable intervallic contents to build up the multiple layers of tension in the film. (I will discuss them in more detail in the following chapter.)
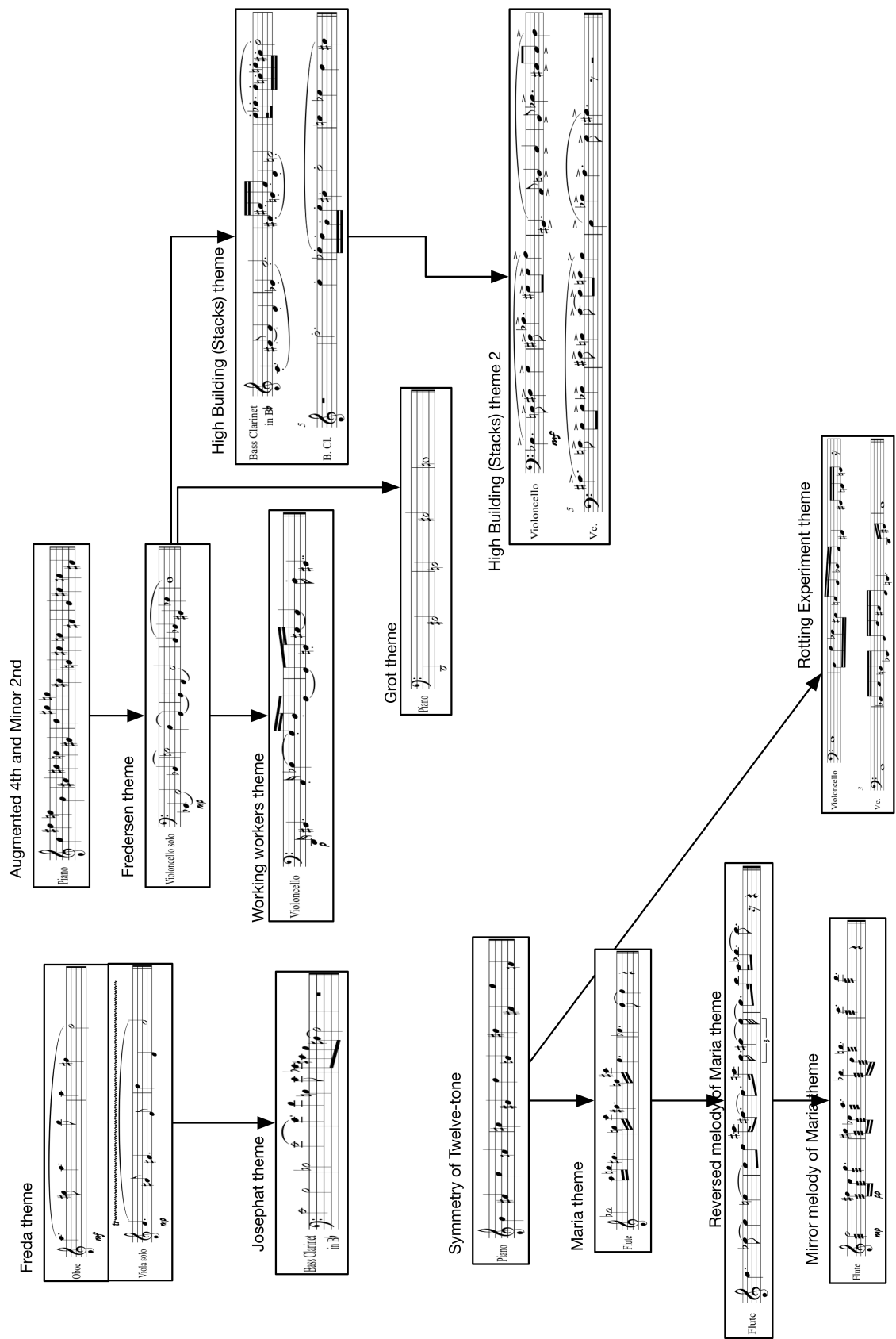
Fig. 1. 15 The web of themes in *Metropolis*

1.4.4. Shore's signification of music in a social and cultural context

I first encountered Howard Shore's music with the film *The Silence of the Lambs* (Demme, 1991). He is also famous for *Big* (Marshall, 1988) and *Mrs. Doubtfire* (Columbus, 1993). However, Shore's great influence within fantasy films is quite remarkable in *The Lord of Rings* series (Jackson, 2001-2003). His anthropological approach to composing has strongly affected me: his intentions to signify each of principal cultures with musical signs are well witnessed in *Tolkien*'s World. The history of fictional music originates from the investigation of folk music that derived from Celtic, Middle, Eastern, and African traditions (Adams, 2010, p. 2). In order to demonstrate this, the hobbits are highlighted in Celtic hues and the ancient Elves, like *Mordor,* are equated with chromatic harmonies and Eastern-shaded tones. Isengard' s escalating industrialism is represented by the sound of a metal-hammered percussion on a weighty low brass (Adams, 2010, p. 11).

In my *Metropolis,* I carefully explored the possibilities to reflect the cultural and semantic implications in music. I have composed for the Yoshiwara club (Fig. 1. 16), a nightclub in the Metro city for drinking and dancing, to encompass social meanings. For the scene, which depicts the worker 11811 (George) heading to the Yoshiwara Club, I wrote light club music using a jazz-like timbre. I was influenced by jazz of the 1920s and 1930s, such as Fletcher Henderson's "Wrappin' it up" (1934) and Bert Firman's "Hangin' Around" (1927). I have scored for old-style jazz, though I hesitated to write orchestral music. Therefore, I reduced the strings and increased the brasses instead: staccato in brass and pizzicato in strings are goot at mimicking the timbre of the original jazz band.

Fig. 1. 16 Music for Yoshiwara club in my *Metropolis,* No. 10, bars 12-17

1.4.5. Morricone's use of iconic music for the protagonist

Music has the power to convey meaning to listeners as a sign. As a complex of diverse and complicated musical signs, music serves as a representation of composer's ideas or poetic intentions. "In the process of classifying relationships between 'signs' and their 'objects', Charles Sanders Peirce who laid foundation of the study of signs and sign relationships identifies three categories of signs: icon, index, and symbol. An icon is a particular type of sign, which imitates or bears similarities in appearance or perception to the object which it represents" (Chandler, 1994). Thus, the icon in music means musical elements or devices made up of the combination of such musical elements to directly denote something extra-musical, i.e. what the composer intends to express.

Moriconne's music pieces are extremely iconic in this regard. For example, he adopted a Hawaiian guitar in order to recall Hawaii. In the same vein, he chose an electric guitar sound to denote southern American culture in *The Good, The Bad and The Ugly* (Leinberger, 2004, p. 23). By doing so, he perfectly regenerated the Latin culture and the social climate of the 1960s.

The electric guitar is used for playing section B (Fig. 1. 17 a) of the main title of *The Good, The Bad and The Ugly*. This melody represents the characters' motion of moving forward on foot, on horseback or in a stagecoach (Leinberger, 2004, p. 81). The rhythmic pattern of Fig. 1. 17 b) accompanies section B (Fig. 1. 17 a): Tagg calls it 'Galloping' (=gallop sound), divided in the part, 'Composite of Anaphones'. Tagg (2012) sees that Morricone also used the motif of the 'Diddle-dum diddle-dup' gallop in the sonic and kinetic aspects of his work (p. 509).

a) Section B of the main title, bars 12-27

b) Percussive accompaniment of the section B

Fig. 1. 17 Ennio Morricone, *The Good, The Bad and The Ugly*

Morricone inspired me to use an iconic timbre in combination with an anaphonic motif in *Metropolis*. For the Freder theme, I selected a bassoon to generate amusing sound, because the bassoon is usually associated with the comic image in silent films. Moreover, it provides a good lower range and has agility and relative clarity (Mera, 2002, p. 103). Freder is the saviour figure and has elements of heroism, too. However, he is simultaneously funny and comical. For these reasons, he serves as the 'mediator' who solves the problem with his efforts, perhaps differently from 'typical heroes' who have special powers and abilities. I portrayed Freder as having rapid movements and being very active as a male character. This is why I selected the bassoon to depict this image. As shown in Fig. 1. 18, I allowed the French horn to take a countermelody to complement the heroic side of Freder.

Fig. 1. 18 Variation 20 on Freder's theme, *Metropolis,* No. 23, bars 39-45

2. *Metropolis*

Metropolis is a scientific film directed by Fritz Lang in 1927. *Metropolis* narrates about a futuristic city where industrialist Joh Fredersen seeks to maintain his workers' oppression. To this end, he conspires with an inventor, Rotwang, to create a cyborg that will impersonate Maria, a prophetic character to whom the numerous workers admire and listen. The cyborg is sent to deceive and control them. Earlier, Freder, son of Fredersen, falls in love with Maria as the result of a chance encounter in a 'Wonder Garden'. He then seeks to find her again and, in his quest, he comes closer to understanding the workers' unhappy situation. The film focuses on the workers' suffering, Freder's love for Maria, and the evil Rotwang's cyborg creation under the direction of Fredersen. Eventually, a catastrophe is averted. Maria, who has been placed in danger, is rescued and, in the end, goes through good triumphs over evil.

Lang's *Metropolis* fascinated me not only because it has a very intriguing storyline, but also because it is full of kaleidoscopic visual images that can be successfully transvalued into another medium, music. The film was so symbolic and sometimes iconic that it stimulated my desire to write music. I was excited to realize that serious composers like Arnold Schoenberg might have influenced Gottfried Huppertz's original scoring. I now imagine what it would have been like if this film had contained music that prevailed in the late 1920s and 1930s. When it was firstly released in 1927, the music sounded closer to late romanticism than to modernistic trends. In this regard, Huppertz's music is old-fashioned in terms of a style and technique.

In contrast to the conservative traits of the original score by Huppertz, Giorgio Moroder (1984) released music for a colourised version of the film. The music in a popular rock style contains a number of pop songs by such artists as Bonnie Tyler, Pat Benatar, Freddie Mercury, and Adam Ant (Hills, 2015).[2] Unlike the original *Metropolis* score for 1927, Moroder's production was rich in references from the contemporary music.

What will my own scoring for *Metropolis* be like? What kind of style should I represent in the third release of the film? What devices do I have to

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[2] http://metropolis1927.com/#restoration

set up to express surreal circumstances? These inquiries led me to contemplate much in my pre-compositional stage. Inspired by the musical styles and techniques of Schoenberg, Anton Webern, Alban Berg, George Perle and others, on the one hand and depending upon what I owe from recent research, on the other hand, I have embarked upon creating a new score that would sound more contemporary and unique.

2.1. Leitmotif as a device for thematic manoeuvre

In creating a music soundtrack for *Metropolis*, I thought that it might be useful to compose different multiple themes for the characters in order to illustrate their specific psychological profiles. In addition, I decided that I would create variations and transformations for these themes, depending upon various circumstances where the characters are situated. Fig. 2. 1 illustrates the relationships basically between the themes and their original sources. The genealogy demonstrates from the sources the primary themes assigned to main characters of *Metropolis* originate from. In the next paragraphs, I will discuss each composed theme in more detail.
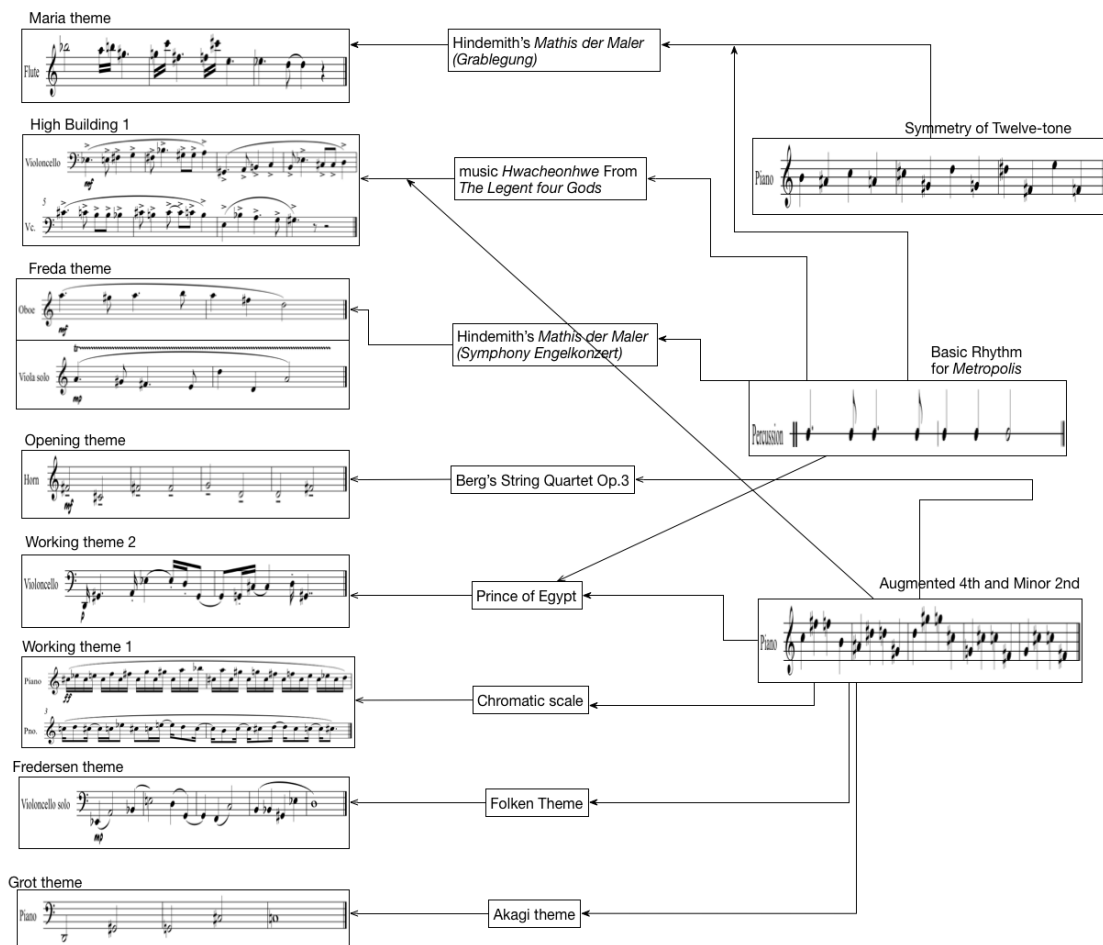
Fig. 2. 1 Inspiration of themes and leitmotifs in *Metropolis*

2.1.1. Freder music

Freder is the most notable character among all the protagonists, because he is a mediator who feels pity for the workers and, simultaneously, he is the son of the industrialist who makes the workers tease. Freder is in love with Maria and this gives his character an extra emotional dimension. The different qualities that Freder possesses provided me with ideas of transforming his themes in diverse ways.

1) General inspiration for Freder's theme

As previously discussed, the reason why I chose the bassoon for Freder is because it is agile, yet somewhat comical at times. In writing the original tune for Freder, I was inspired by the bassoon's role as seen in the beginning of Hindemith's *Mathis der Maler Symphony Engelkonzert* (not shown). In the

first part of the piece, the bassoon plays the melodic line, echoed by the clarinets and flutes. The French horn accompanies the woodwind melodic line with an octave pedal, adding a grander tone. In this regard, the melody is reminiscent of Elfman's *Batman* theme (1989).

Although Freder's theme in my *Metropolis* is mainly polytonal and serial at times, at least the beginning portion hears tonal, especially in the stadium scene (00:03:00) because of the obvious dominant-tonic axis in A Major (Fig. 2. 2). When the character changes throughout the film, happiness of this version of the theme gradually disappears.
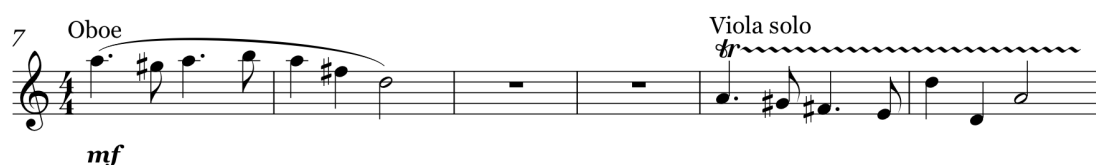
Fig. 2. 2 Freder's theme, *Metropolis,* No. 3, bars 7-12

2) Variations for Freder

To represent Freder at different stages in the film, I wrote a number of variations in which thematic materials were treated by different ways of orchestration. Freder has 24 variations; I categorised them mainly through their rhythmic features. Fig. 2. 3 shows four types of variations with their parent variation at the top; each type then has its own descendent variations. I will discuss and demonstrate later how I composed variations under each type.

Fig. 2. 3 Genealogy of Freder themes

① **Type 1**

Cohen's research had a decisive influence on decision making throughout my compositional process, particularly with regard to rhythmic activity. Cohen (2005) has revealed that the temporal relation of the musical and visual patterns interacts with each other to reinforce mutual images (pp. 22-23). With this in mind, I have seriously endeavoured to devise temporal and rhythmic quality of Freder variations to express the character's psychology or to depict specific environments where the character has been situated. Notice variations under Type 1. One could witness that the rhythmic activity coincides with the character's activity in variations under this type. For example, busy rhythms of variation 5 represent Freder's hard working; Variation 18 describes lively the fighting scene between Freder and the workers where aggressive dotted rhythmic figures contribute to the increase of activity, a sense of violence.

Pallesen et al. (2005) conducted a research about the listeners' emotion process when they hear music based not only on the major or minor tonality, but also on the atonal idiom. This research encouraged me to explore and further apply emotional responses to a choice of keys or scalar materials. By using a whole-tone scale, I composed variation 1 played when Freder is playing with the chosen people in the wonder garden (Fig. 2. 4). The wonder garden conjured up a dream world on a personal level and, therefore, has the magical and fantasia circumstance, which I have associated with the whole-tone scale. I was recalled of Debussy's *Voiles* when I was initially watching the scene and tried to reflect this impression of the moment in this variation.

Fig. 2. 4 Variation 1 on Freder's theme, *Metropolis,* No. 4, bars 6-7

Willimek and Willimek (2013) also mention that the whole-tone scale tends to arouse a feeling as if in a dream or in the water, because it is extremely difficult to recognize a tonal focus in the whole-tone scale (p. 22). Their hypothesis of musical equilibration offers a ground of relating a specific interval, chord, scale or collection to particular emotions. They continue about the effect of the whole-tone scale as follows:

> By a similar token, the character of the whole-tone scale corresponds to the mental image of floating weightlessly without a deliberate focus. In film music, these sorts of chords are used primarily to score moments that involve different kinds of weightlessness, such as being under water, floating in space or drifting in the subjectively gravity-free state of dreaming. A film that shows a sleeping person while playing whole-tone music is intended to convey to the audience that the sleeper is starting to dream (Willimek and Willimek, 2013, p. 22).

② Type 2

The rhythm of the type 2 is twice as long as Type 1. This represents the type 2 accompanying the steady mindset of Freder. The melody of the variation 2 (Fig. 2. 5), which evokes Freder's curiosity, has a tendency roughly towards B^b minor; however, the raised mediant (D-natural) creates instability. The enharmonic respelling of F$^\sharp$ into G^b helps discover this tonal implication.
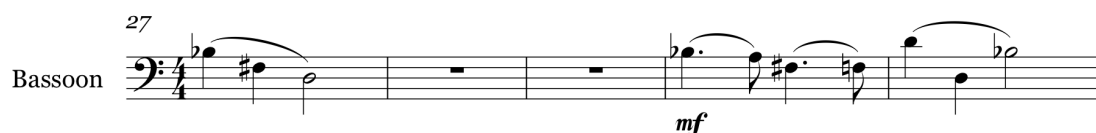

Fig. 2. 5 Variation 2 on Freder theme, *Metropolis,* No. 5, bars 27-31

Variation 4 is based on the chromatic scale to represent Freder standing next to the door of Fredersen's office with an unhappy expression on his face (Fig. 2. 6). Variation 12 implies the key of B^b major in the beginning, but the melody finishes with an E-natural, which does not belong to the key. The triton axis (B^b-E) outlined by the melody was my deliberate choice to represent deadly sins (Fig. 2. 7). My intention was to show that, when a sin is committed, it may feel good, but that the result is undoubtedly horrible.

Fig. 2. 6 Variation 4 on Freder's theme, *Metropolis,* No. 7, bars 28-31

Fig. 2. 7 Variation 12 on Freder's theme, *Metropolis,* No. 16, bars 19-22

③ **Type 3**

Type 3 represents static emotions rather than activities. For example, variation 3 accompanies Freder's feeling of a pity for the workers when they have been wounded by the monster machine; variation 17 carries a similar role to that of variation 3. Variation 15 represents Freder's tiredness as he sits on the sofa. Variation 23 accompanies the romantic scene where Freder and Maria kiss. Fig. 2. 8 accompanies the workers walking to where Freder, Maria and Fredersen stand after the death of Rotwang. The French horn plays variation 24 where the harmonic progression C#-Am-Dm-C-A-G#m-Fm-C appears in bars 10-19. I located A major and A minor chords closely to provoke the mode of negotiation or reconciliation. However, the progression becomes stable with C chord from bar 19 to represent their peaceful resolution, because the later part of the chord progression beginning at m. 15 tends to establish a C-centricity and then generate a sense of resolution at m. 19. One could hear as if the chord progression formed a plagal cadence in the key of C major.

Fig. 2. 8 Variation 24 on Freder theme, *Metropolis,* No. 27, bars 10-19

④ **Type 4**

Type 4 is the gathering of irregulars. For example, variation 9 has irregular timing to represent the chaos and complexity of what Freder experiences during the scene (00:26:02). Variation 11 associates with Freder's nervous emotion by a double dotted note (00:36:25). In the rhetoric tradition of the Baroque era, dotted rhythms symbolized pain and uncomfortableness. Variation 16 represents comfort when Freder is in the bed (00:45:24) through a stable rhythm with crotchets and octave progression. The harmony represents the atmosphere of the scene.

I composed Freder's variation 11 by using subdominant harmony. I tried to express solemnity and reverence of church music with the subdominant-tonic progression, because the plagal cadence serves as a norm standing for the Christian religion (Willimek and Willimek, 2013, p. 12). Such a progression is also found in variation 12 between the clarinet and bass clarinet and depicts the scene where Freder is walking and finds Maria in the church

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(Fig. 2. 9). This variation has a parallel subdominant progression in order to emphasise the church's mood where Freder takes a rest in the bed.

Fig. 2. 9 Variation 12 on Freder's theme, *Metropolis,* No. 16, bars 1-27

2.1.2. Twelve-tone themes: Maria's music and Rotwang's experimental theme

I adopted a chromatic scale for the theme of Maria and Rotwang's experiment. I will subsequently explain how I was inspired to compose Maria's theme and related themes.

1) General inspiration of Maria's theme

Maria has a spiritual inspiration for the workers and Freder is her lover. She is also a symbol of goodness. What I initially envisaged for Maria is the peaceful flute, which is recalled of the opening passage (bars 1-8), Hindemith's *Mathis der Maler (Grablegung)*. The piece begins and continues with the flute accompanied by strings. Fig. 2. 10 is the flute melody from bar 4. I was inspired by the dotted crotchet and semiquavers in bars 2-3. Tagg (1999) has suggested the difference between males and females by musical characteristics and thus categorised the flute as a melodic instrument for females (p. 3).

Fig. 2. 10 Hindemith's *Mathis der Maler (Grablegung),* bars 1-8

(flute part: 4-8)

2) Twelve-tone symmetry and Maria theme

I applied symmetry to Maria's tune where notes laid around a pivotal tone centre F# in this case. I combined this with dotted note rhythms for Maria's final theme (Fig. 2. 11). I found that the last three notes descend in a manner that represents Maria's weakness and effeminacy.

Fig. 2. 11 Maria's theme, *Metropolis*, No. 5, bars 7-9

Fig. 2. 12 shows expansions of Maria's theme to represent a romantic situation for Freder and Maria. This varied theme hears when Maria and Freder first made eye contact and met as lovers. The second expanded melody is played first to use fast rhythm and jumps from E to C and C to E♭ again. These fast jumps of the notes represent Maria's surprise as Freder begins to talk to her.

Fig. 2. 12 Expanded melodies of Maria's theme, *Metropolis*, No. 5, bars 13-16

I was inspired by Webern's *Five Pieces for Orchestra* Op. 10 in that the melody line is divided into short fragments and is performed by different instruments. This provoked me to have different emotions while hearing a single melody. What Schoenberg calls the *Klangfarbenmelodie* represents Maria's complicated emotions through the melodic expansions of Maria's theme. Although the melody is still on the woodwinds, the oboe reinforces the tension between the two romantic characters, because the oboe has a faster attack sound than the flute. I used the oboe to increase the tension in this moment. The bassoon receives the last part of the melody to inherently signify that Maria will fall in love with Freder (Fig. 2. 13).

Fig. 2. 13 Application of Klangfarbenmelodie for Maria, *Metropolis,* No. 15, bars 1-6

3) Maria Variations

Maria theme consists of 27 different variations (Fig. 2. 14). I categorized the variations into four types and further two different melodies that cannot be categorized into types. The variations represent the emotions and activities of Maria for different moments in the film. The chosen rhythms relate to physical activity; the intervals and harmonies provide an emotional bond.

Type 1 represents disappearing or reducing through the descent sequence. For instance, variation 1 represents the plan of kidnapping Maria and variation 23 represents the dragging of the robot Maria to be burnt at the stake.

Type 2 represents steadiness before something happens. For example, variation 5 is the accompaniment when Maria walks in the cave accompanied by candle light and this scene continues into the next scene of the kidnapping by Rotwang. Variation 20 also accompanies the workers' pent-up anger and is linked to burning robot Maria.

Type 3 has shorter rhythmic values than others and represents hurried movements. Variation 17 is a continuation of variation 16 and both variations represent Maria's tension and agile movements.

Type 4 focuses on diverse emotions of the character. Variation 19 represents the emotion Maria feels when she tries to save children. She is in a hurry, but, simultaneously, feels pity for them. Consequently, I used relatively longer rhythmic values with a chromatic sequence at the beginning. Variation 26 represents the fear of Maria, because this melody accompanies Maria when

she is running away from Rotwang. This melody plays six to eight times in order to emphasize fear through the unstable rhythm.

Variation 4 is not categorised, because it is the only romantic melody derived from Maria's theme. This theme portrays the first moment when Freder and Maria have met in the underground chapel. The expanded melody has a different order of the twelve-tones, which is used only in several variations of Maria's theme.
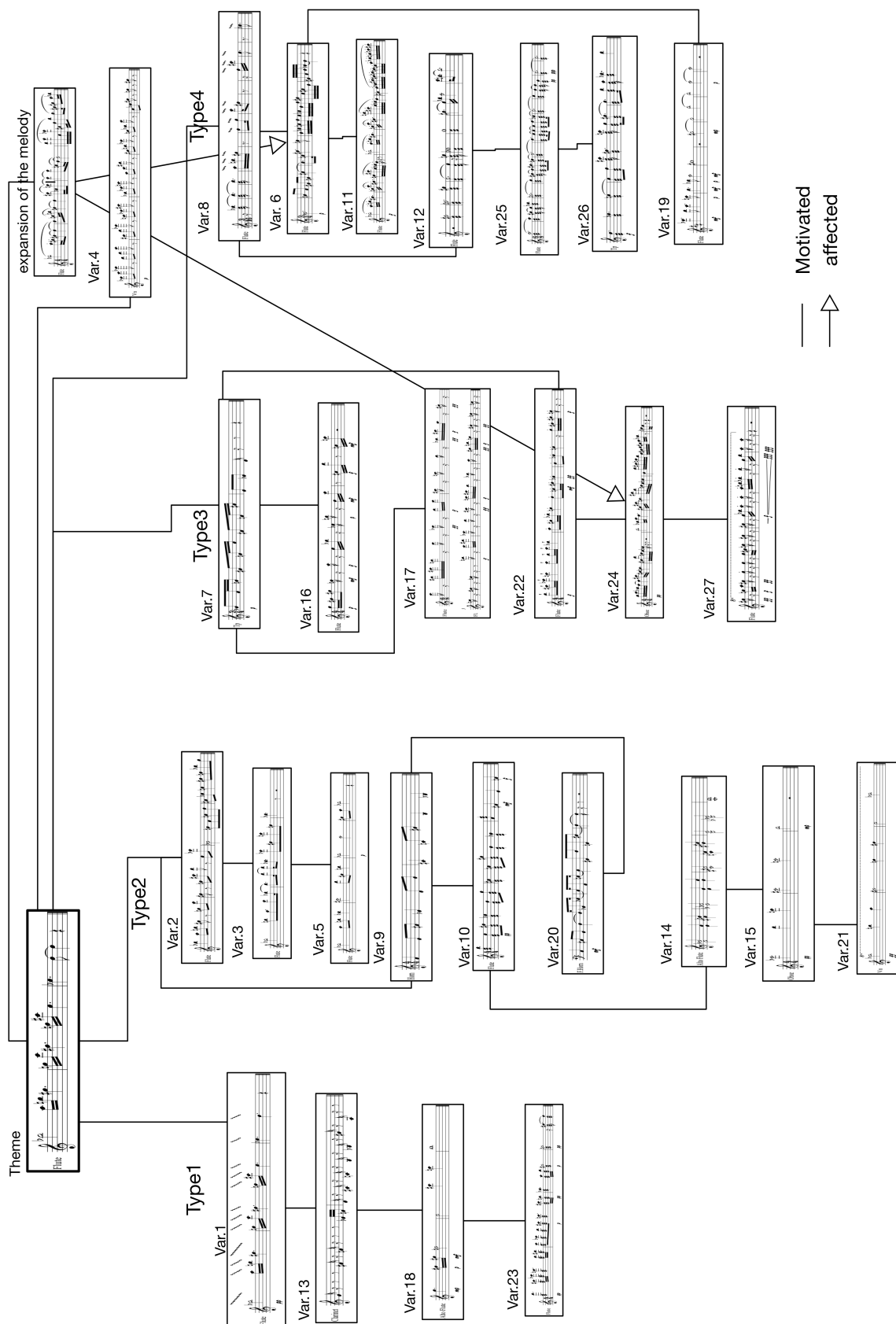
Fig. 2. 14 Synopsis of Maria's themes

I used a retrograde and inversion of a twelve-tone technique to represent the robot Maria. The robot Maria is here a bad one, which appears with Maria. Rotwang, evil scientist, invented the robot and cloned Maria into the robot.

The reversed melody (Fig. 2. 15) accompanies the appearance of the robot. When the robot is activated as Maria, I have changed the order of the fourth and fifth notes (F and C#) to create a steeper sequence after the chromatic sequence in order to arouse a negative emotion.

In the mirrored melody of Maria's theme (Fig. 2. 16), I transposed it to represent the behaviour of the robot Maria (Fig. 2. 17). This theme is played with variation 6 to demonstrate that the robot pretends to be Maria. In terms of the timbre, these melodies adopted the flutter tongue in order to emphasise the aggressive character.

Fig. 2. 15 Robot Maria's theme 1, *Metropolis,* No. 11, bars 36-38

Fig. 2. 16 Mirrored version of Fig. 2. 11

Fig. 2. 17 Robot Maria's theme 2, *Metropolis,* No. 19, bar 16-18

Fig. 2. 18 shows the robot Maria's theme 1 reversed from Maria's theme and its variations. Espousing Cohen's (2005) research of rhythmical effect and activity, I wrote these variations. The two robot themes consist of a climbing sequence. I used flutter tongue to represent tension or fear. In variation 1 of the robot Maria's theme 1, the rhythm of Maria's expanded melody is applied for the variation 1 to represent the first movement of the robot (compare Figs. 2. 18 and 2. 19). Variation 6 is derived from variations 3 and 4, because it

shares the same rhythm as variation 3 and the same intervallic organization as variation 4. The diminished fifth of variation 3 is changed to an augmented fifth in variations 4, 5 and 6; I intended to create a steeper jump to represent a stronger tension.

The robot Maria's theme 2 and its variations mostly stand for a high degree of activity. Variation 1 represents the robot Maria's shouting with a larger interval and a more unstable rhythm than Maria's theme. Variation 2 is affected by the symmetry of the twelve-tone technique where C is centred with the other notes spread from the C. This aggressive quality of low string instruments represents the furious workers and Grot; the intervallic augmentation is associated with the growing people's anger. The falling sequence of variation 3 represents the death of the robot Maria by fire.
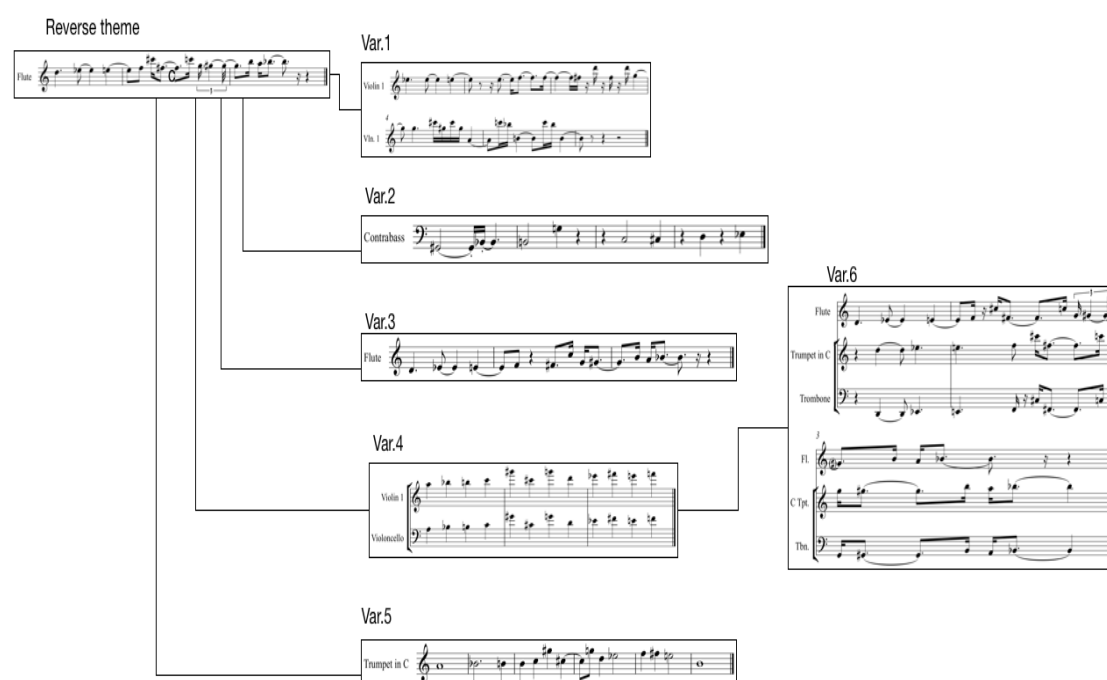

Fig. 2. 18 Variation scheme of Robot Maria theme 1

Fig. 2. 19 Variation scheme of robot Maria's theme 2

4) Rotwang's experiment theme

I composed another melody from Rotwang and his experiment (Fig. 2.21 a). This is also based on the twelve-tone technique, because this experiment is related to both Maria and the robot. The variations support Rotwang's diverse movement for the experiment (Fig. 2. 21 b). I was inspired by the film *The Incredible Hulk* (Leterrier, 2008) and *X-Man Origins: Wolverine* (Hood, 2009). Both primary characters undergo a scientific experimental metamorphosis in order to change their character within each film. The excerpt from *X-Man Origins: Wolverine* (Fig. 2. 20) motivated me to compose music for the experiment and its operation of cloning Maria to a robot (Fig. 2. 21 c).

Fig. 2. 20 Strings and bass drum from *X-Man Origins: Wolverine*

a) Rotwang's experiment theme only in No. 17, bars 32-33

b) Rotwang's experiment themes and variations in No. 17, bars 30- 39

c) Percussion accompaniment in No. 17, bars 41-44

Fig. 2. 21 Rotwang's experiment themes and variations in *Metropolis*

2.1.3. Interval class 1 and 6

A combination of interval classes 1 and 6 (SC3-5) is one of the primary sonorities in my composition. Such sonority introduced in the opening theme appears later in Fredersen's theme, Grot's theme, working themes 1 and 2, etc. Fig. 2. 22 shows the opening of the theme that consists of an augmented fourth and minor second.

Fig. 2. 22 Opening theme, *Metropolis,* No. 1, bars 5-10

1) Fredersen's Theme

Fredersen has a hard-hearted personality; however, his behaviour throughout the whole film displays that he merely pretends to be cold-hearted. This ambivalent character reminded me of a character from a Japanese animated series called *Escaflowne* (Kawamori, 1996). The character's name is Folken and his personality is similar to that of Fredersen. Fig. 2. 23 is Folken's theme from *Escaflowne*. I created a similar mood by maintaining the iambic rhythm and substituting the intervallic content of *Escaflowne* by the tritone and minor second (Fig. 2. 24).
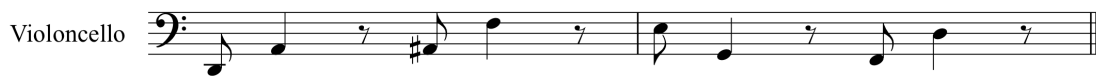
Fig. 2. 23 Folken's theme, *Escaflowne*, bars 1-2

Fig. 2. 24 Fredersen's theme, *Metropolis*, No. 7, bars 18-22

2) Rotwang's theme

This theme accompanies Rotwang when he meets Fredersen (Fig. 2. 25). This theme aims to suggest that Rotwang is sympathetic to Fredersen. However, Rotwang's melody features a perfect fourth, while Fredersen's has an augmented fourth (00:19:34). This represents Rotwang's hidden intentions.

Fig. 2. 25 Rotwang theme, *Metropolis*, No. 11, bar 21-25

3) Grot's theme

Grot is a guardian of the heart machine and a leader of the workers. I was inspired by the Akagi theme from the Japanese animation *Slamdunk*

(Sakamoto, 1993-1996) where Akagi is the captain of a high-school basketball team who has a very strong character. Fig. 2. 26 is Akagi's theme, which consists of a tritone and minor sixth, each followed by a semitone. Espousing intervallic contents of Akagi's theme and manipulating the rhythmic values, I composed Grot's theme (Fig. 2. 27). I reduced the rhythmic values of the theme into a half.

Fig. 2. 26 Tetsuro Oda, Akagi theme in *Slamdunk*

Fig. 2. 27 Grot theme, *Metropolis,* No. 21, bars 31-33

4) Working theme 1

Fig. 2. 28 is based on a chromatic scale. This melody marks a fast movement symbolizing busyness of the machines and workers. The theme demonstrates the rolling of gearwheels on the piano, but it also represents a worker who busily works on the bass clarinet. The timbre of the piano is more percussive than the bass clarinet. The percussion-like treatment of piano and woodwind is already foreshadowed by Howard Shore and, more originally, Bartok and Stravinsky. Shore used percussion sound to represent industrial sound for Isengard; the land of the Orcs (Adams 2013, p. 11) (from 01:00:12 *The Lord of the Rings: The Two Towers*).

Fig. 2. 28 Working workers theme 2, *Metropolis,* No. 1, bars 19-26

5) Working theme 2

Working theme 2 (Fig. 2. 30) is connected with Fredersen's theme. The orchestration is influenced by a scene from *Prince of Egypt* (Hickner, 1998). The particular scene is where the Shamans introduced the Gods of Egypt. I was inspired by the repetition of the strings (Fig. 3. 29). This is how I began to use a tritone followed by a semitone as a sign of gloom in *Metropolis*. The use of these intervals is also similar to that of Morricone explained earlier: recall that he used microcells to represent characters.

Fig. 2. 29 String line of *Playing with the big boys* in *Prince of Egypt,* bars 1-5

Fig. 2. 30 Working theme 2, *Metropolis,* No. 6, bars 1-2

6) High building theme 1

This theme portrays the work of gearwheels. The percussive use of strings, inspired by Stravinsky's *The Rite of the Spring, Dance of Young Girls* (Fig. 2. 31), is appropriate to describe the machine-like movement of the wheels. Instead of percussions, strings, though less aggressive than percussions, were perfectly contextualised: my intention was to stimulate the motor's mild impulses through the rhythmic activity.

Fig. 2. 31 Igor Stravinsky, *The Rite of the Spring: Dances of the Young Girls*

I intended to describe a large object through a large ensemble of strings. For this purpose, I used the theme accompanying the saw-toothed wheel to describe the high building. My intention was to explain that the wheels must work ceaselessly in order to maintain the buildings. This melody represents the main building of *Metropolis* where Fredersen's office is located. The timbre of the cello has a decent and noble image; this kind of metaphoric application of the cello sound came from a soap opera based on the ancient Korean history. The music *Hwacheonhwe* from *The Legend Four Gods* (Kim, 2007) demonstrated lively instances of the cello's aggressive quality. *Hwacheonhwe* is the enemy group of the protagonists with simultaneously both gentle and evil characteristics: Fig. 2. 32 is the first part of *Hwacheonhwe's* theme.

Fig. 2. 32 The *Hwacheonhwe's* theme, *The Legend Four Gods,* bars 1-6

As shown in Fig. 2. 33 a), the first two bars provide the motif for the theme and each motif jumps within the theme.   Bars 7-8 show a tritone, which

provokes negative feelings about the buildings. The string accompaniment (viola and double-bass) is the same as the music of the workers' walking theme in order to depict restlessly moving machines and workers (Fig. 2. 33 b). Fig. 2. 33 c) is a varied theme that symbolizes the destruction of the buildings and machines. I wrote the theme by adopting a busy scalar material, each articulated by the accent to associate the disassembly of the theme with the demolition of the building (Fig. 2. 33 c).

a) High building theme 1 only, *Metropolis,* No. 1, bars 11-18

b) High building theme, No. 1, bars 11-19

c) Destruction of the buildings, No. 22, bars 46-49

Fig. 2. 33 Building themes in *Metropolis*

7) High building theme 2

This theme comprises a tritone and a semitone in dotted rhythm. The high building theme 1 is also related to the high building theme 2 by their sharing similar melodic intervals, even though less significant intervals are also mixed. (A tritone is heard at the beginning; and minor / major thirds are related to the high building theme 1). Fig. 2. 34 is the expanded melody of the high building theme 2. Fig. 2. 35 shows that the trombone and cello perform the melody a semitone lower to create a sharp dissonance that symbolizes that the buildings have been built by the pains of the workers (00:02:32).

Fig. 2. 34 High building theme only, *Metropolis,* No. 1, bars 27-33

Fig. 2. 35 High building theme, *Metropolis,* No. 2, bars 33-38

8) Walking workers

This melody is connected with the high building theme 1. This theme represents the walking workers who do not have the will to work and look like lost soldiers. I used the English horn in order to express this psychological

frame of mind of the walking workers. I have been influenced by the game music entitled *Journey* (2012, Sony's Game). The main character of the game travels on foot for his tribe. I felt that the character's sad footstep in *Journey* shares common traits with that of the workers in *Metropolis*. For that reason, I borrowed some ideas from the music of *Journey*. This theme implies the key of B minor, not only because the tonic appears in the second and last bars, but also because the tonics in both bars are prepared by two different leading tones, #$\hat{7}$ and b$\hat{2}$ (Fig. 2. 36 a). However, other notes, such as C and E♭, do not belong to B minor scale. This tonal contrast creates an unhappy mood to exemplify how the workers feel. The accompaniment played by the brass is a continuation of the same material in the strings as in the previous part (Fig. 2. 36 b). Fig. 2. 36 c) represents the running of the workers when they are angry and rush to arrest the robot Maria. In order to represent the act of running, I created the melody by adding smaller rhythmic values for the long notes in the theme.

a) Workers' walking theme only, No. 2, bars 3-6

b) Workers' walking theme, No. 2, bars 1-6

c) Composing out based on workers' walking theme, No. 24, bars 28-40

Fig. 2. 36 Diverse uses of walking themes in *Metropolis*

2.2. Other musical expressions for emotions and movements

There are scenes without main themes. To write music for such scenes in *Metropolis,* I have used octatonic scales and secundal chord: sometimes, I relied upon onomatopoeic expressions to imitate electronic sound with strings.

2.2.1. Two different octatonic scales to represent contrasting characters

I used two different octatonic scales to represent the conflict between Freder and Fredersen. There are only two different octatonic scales: a tone and semitone type (Oct. $_{02}$); and semitone and tone type (Oct. $_{01}$) (Kostka, 2006, p. 31). I assigned to the two scales different aspects of the workers. The tuba plays the octatonic that starts with a semitone (Oct. $_{01}$), while the strings play the other one (Oct. $_{02}$). Tubas are linked to Freder's words, because the tuba is a brass instrument that has a closer timbre to a French horn for representing heroic characters. Conversely, the strings represent Fredersen's speech, because Freder is accompanied by a solo cello and thus the timbre represents Fredersen (Fig. 2. 37).

Fig. 2. 37 Two types of the octatonic scale *Metropolis,* No. 8, bars 16-21

2.2.2. Secundal chord for Rotwang

The secundal chord is built upon from a major or minor seconds or their combination (Kostka, 2006, p. 59). The secundal chord thus provides complexity as a poignant dissonance. As Rotwang is an evil character, I considered this chord to be appropriate for him. These chords (Fig. 2. 38) hear when Rotwang first appears at the beginning of Fredersen's theme of the film. Fredersen's theme proceeds horizontally; by way of contrast, the secundal chord is a vertical accumulation of notes. This represents the inherent antagonism between Rotwang and Fredersen.
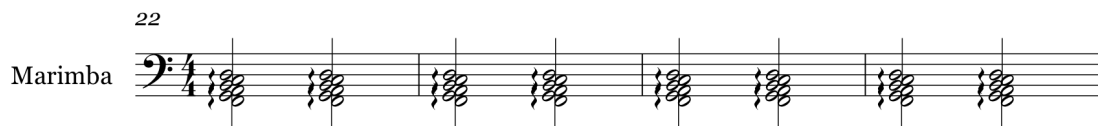
Fig. 2. 38 Secundal chords for Rotwang, *Metropolis,* No. 11, bars 22-25

2.2.3. Contrabass and trombone for electric mechanic sound

When the robot Maria first appears and starts to move (00:21:11), I set up the electrical sound. I was inspired by the scene (00:32:44) from *Matrix* (1999) where the battleship appears with an electric noise. This timbre sounds like an electric noise, reminding of the movement of machines. I used the double-bass and muted flutter tongue sound of the trombone to produce the timbre to generate machine-like sound (Fig. 2. 39).

Fig. 2. 39 Double-bass and trombone, *Metropolis,* No. 11, bars 57-62

2.2.4. Lightning and orchestral sound

I produced the sound for the lightening scene when the machine was destroyed (01:05:15). The trombones represent the initial lightning, while the strings represent the next burst of lightening (Fig. 2. 40). The explosive light is represented by the single note B played by the Wagner tuba.

Fig. 2. 40 Passage depicting electronic lighting, *Metropolis,* No. 23, bars 13-15

2.3. Longitudinal analysis as a strategy map

2.3.1. Relationship between the film's narrative and musical organization

The longitudinal graph provides information about when and which music accompanies each character. The horizontal axis represents primary characters as seen in the film, while the vertical axis indicates the chronology of the film. Thus, the graph shows not only which characters counterpoint which musical pieces, but also which musical pieces are balanced by which other pieces of music.

The first part of the graph depicts the introduction of the characters and their themes. All of the main characters' themes, except for Grot's, are heard. In addition, Freder's theme begins with variations to represent his diverse emotions and actions. There are some moments where the melodies are contrapuntal and these contrapuntal melodies simultaneously represent the relations of the characters or their different emotions throughout the music (Fig. 2. 41).

In the second part of the graph, the two main characters, Maria and Freder, are highlighted. In this part, the relations of the characters and their conflicts become clear. From the 49th minute, the characters face up the actual problems, such as the riot, fighting and destruction. Therefore, I composed themes that fit these major situations.
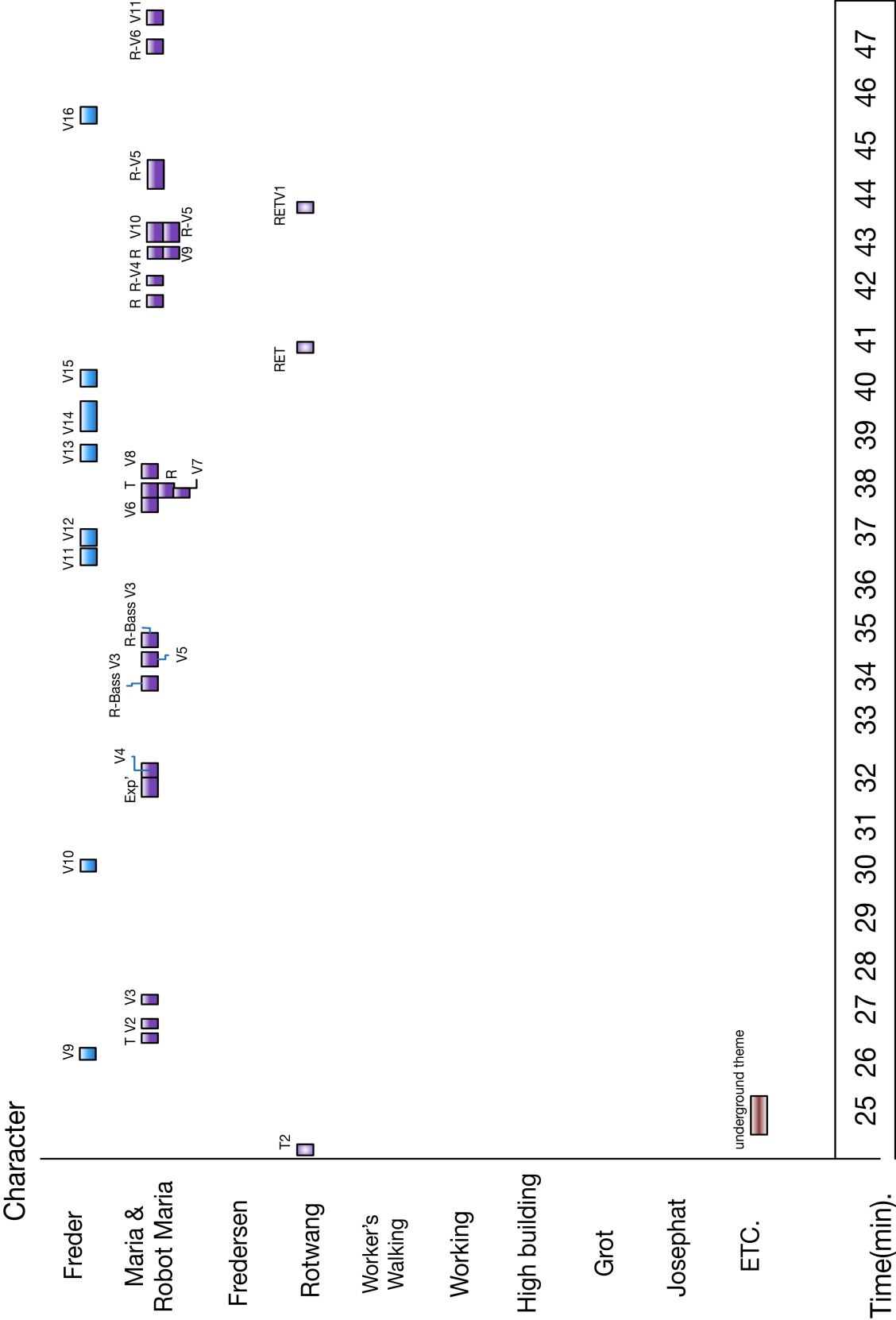
The last graph reveals that music ends with variations of Freder, Maria, Fredersen and Grot. These characters are the key-holders of the problem, so I have used their themes in this spot. The last piece of music is derived from Freder's theme, because he is the most important character in the film. There are several melodic parallels to represent multiple emotions and characters.
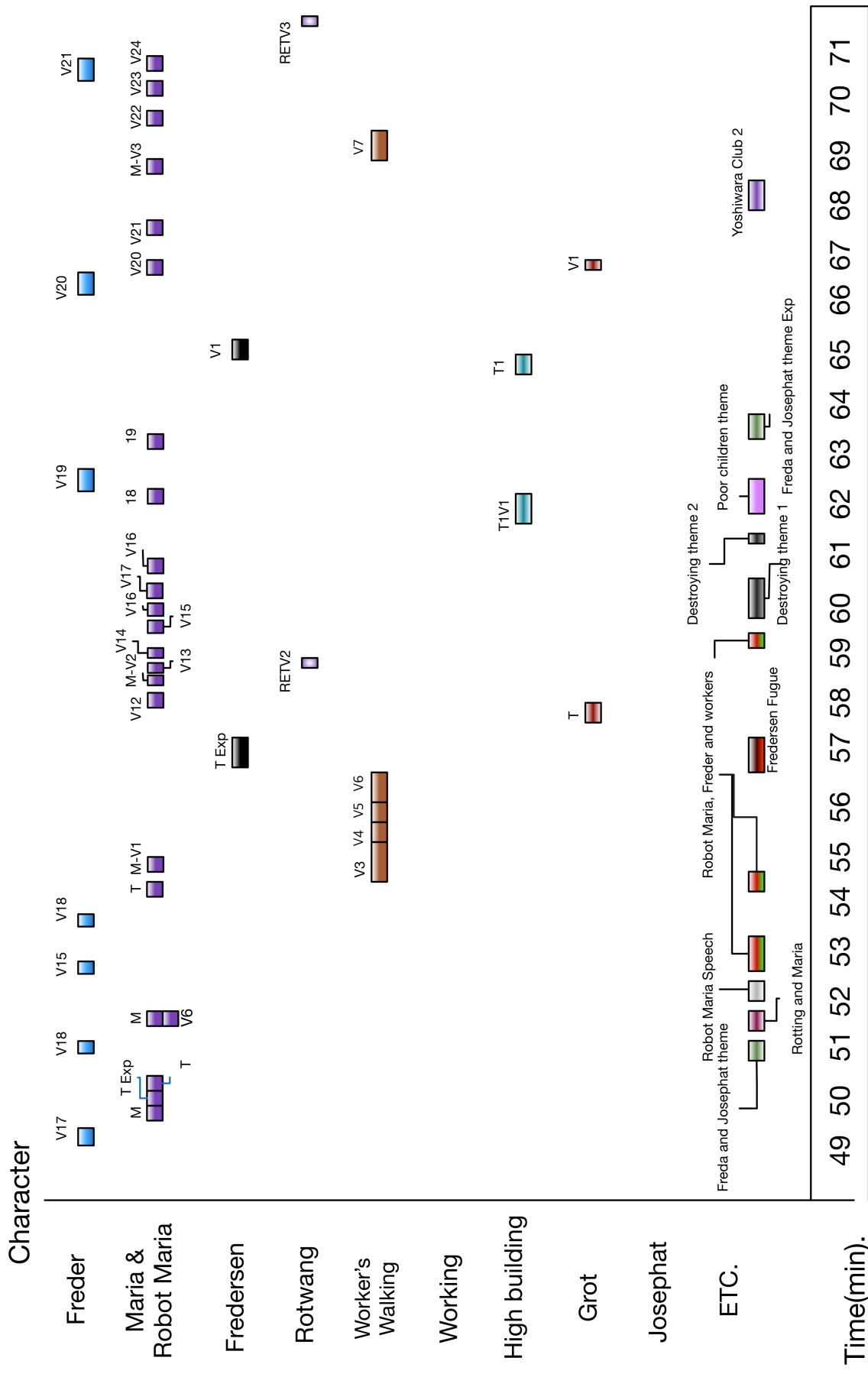
Longitudinal graph of themes in *Metropolis*

Number indicates number of variation. / T: Theme/ T1 : Theme 1 / Exp : Expanded

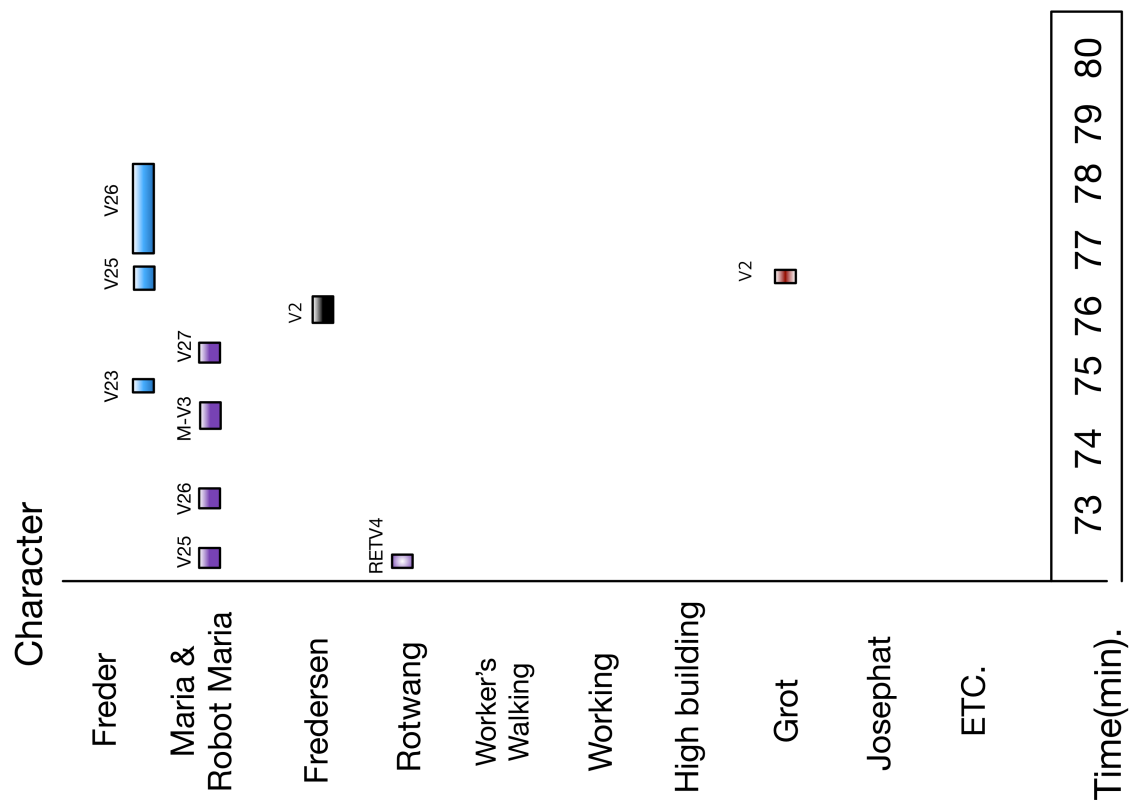R: Reverse of Maria theme/RET: Rotwang Experiment Theme /M: Mirror of Maria's theme

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Character

Freder

Maria &
Robot Maria

Fredersen

Rotwang

Worker's
Walking

Working

High building

Grot

Josephat

ETC.

Time(min).

V17 V18 V15 V18 V19 V20 V21

V17 M V6 T M-V1 V12 M-V2 V14 V13 V15 V16 V17 V16 18 19 V20 V21 M-V3 V22 V23 V24

T Exp V1

RETV2 RETV3

V3 V4 V5 V6 V7

T1V1 T1

T V1

Freda and Josephat theme
Rotting and Maria
Robot Maria Speech
Robot Maria, Freder and workers
Fredersen Fugue
Destroying theme 1
Destroying theme 2
Poor children theme
Freda and Josephat theme Exp
Yoshiwara Club 2

M T Exp T

49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71

69

Fig. 2. 41 Longitudinal graph of themes in *Metropolis*

2.3.2. Counterpoint between themes

As is evident in the longitudinal graph, the contrapuntal melody represents the hard-working workers (string part) and the other melody represents the high building with the bass-clarinet (Fig. 2. 42). These two contrapuntal melodies connote that the high structure is built and maintained by the workers.

Fig. 2. 42 Workers' working theme and high building theme 2 in counterpoint, *Metropolis,* No. 6, bars 1-7

The next example demonstrates the contrasting expanded themes of Freder (Bassoon) and Fredersen (Violoncello). This part (Fig. 2. 43) depicts the argument between the father and the son. Fredersen upholds his opinion and has a negative reaction towards Freder. This argumentative situation is encoded through a tritone. Because of both F and F♯, Freder's music here simultaneously implies D minor and major. This sequence represents the weakness of Freder's persuasion power.

Fig. 2. 43 Freder and Fredersen's contrapuntal dialogue, *Metropolis,* No. 7, bars 26-33

A romantic aria is derived from a combination of Freder's theme and Maria's variation 4 (Fig. 2. 44). The flute here takes a leading role, while the violin provides the harmonic background by arpeggiated chords. Although this passage is based on E^b major, violins' accompaniment (Variation 4 of Maria's theme) gradually becomes dissonant to represent the pain caused by the love between Maria and Freder.

Fig. 2. 44 Romantic music, *Metropolis*, No. 15, bars 5-10

Fig. 2. 45 contains Maria's theme (flute 2, trombone), robot Maria's theme 1 (flute 1 and 3, violin 1), and variation 7 (trumpet) of Maria's theme. This music accompanies the scene where Rotwang is approaching Maria to clone her to make the robot (00:37:30). I used Maria's theme and the robot Maria's theme 1 together to represent Rotwang's intentions to destroy everything; Maria's variation 7 supports the increasing tensions between the characters.

Fig. 2. 46 is played in the scene where the cloning is completed by Rotwang. Variation 9 on Maria's theme (French horn 2 & 3) and variation 4 on the robot theme 1 (flute 1) represent the static status of both characters. Other instruments represent the electric ring of the light (00:42:55).

Fig. 2. 45 Variation 7 on Maria's theme and Robot Maria's theme 1,

Metropolis, No. 16, bars 41-46

Fig. 2. 46 Use of counterpoint for the cloning robot and Maria,

Metropolis, No. 17, bars 71-73

Fig. 2. 47 shows a dance music included in Maria's theme (00:47:25). This scene is the beginning of the depravity caused by the robot Maria. I was recalled of the scene of decadence from *The Ten Commandments* (DeMille, 1956)(02:53:40). The music of this scene has repeated motives to represent dancing and corrupt actions of people and is accompanied by percussions, such as tom-tom and Taiko drum. The distorted brass sound is also heard from the scene. I have used the repetition by combining fragments of Maria's theme and the robot theme 1. As can be seen in bars 93-98, the string part plays the same motif more often.

Fig. 2. 47 Robot Maria's dance 1, *Metropolis,* No. 18, bars 92-98

Fig. 2. 47 *Continued*

2.4. Conclusion

This thesis was an investigation of the connection between orchestral music within the film *Metropolis* and the way in which the music invokes a myriad of human emotions in the film audience. An exploration of relevant research enabled me to produce music for film in a systematic evidence-based way. The study of contemporary music skills applied to moving images is worthwhile and allows for experimentation through sound samplers in order to create a realistic orchestral sound. Thus, this research is an example of how effective the sample library orchestra can be in terms of providing incidental music for film, games and television.

In my music, combining current symphonic composition skills with iconic orchestral gestures from the repertoire allowed me to effectively transmit emotions. This portfolio was inspired from the belief that there is no objective or literal meaning transmitted by music, but, rather, a subjective communication that draws upon the pre-existing repertoire of film and symphonic music. This results in a musical language that the film audience will arguably understand.

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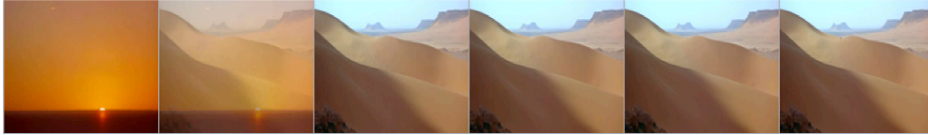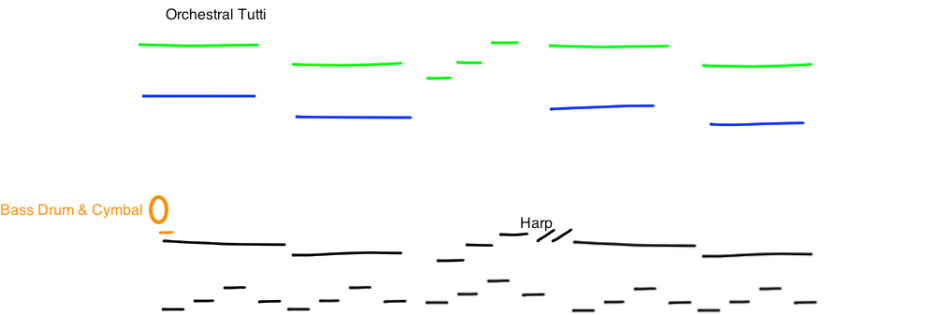
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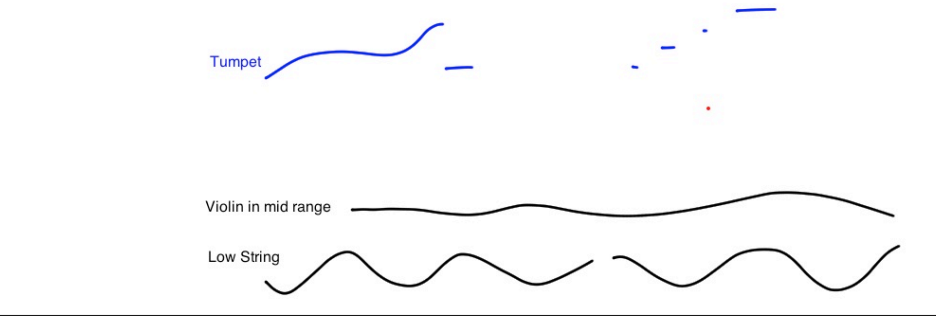
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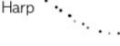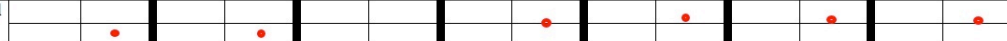
Appendix. Analysis of emotional status and instrumentation

Lawrence of Arabia

Time (sec)	0	2	4	6	8	10	12
Scene							
Dialogue							
Orchestral Sound							

Time (sec)	14	16	18	20	22	24	26
Scene							
Dialogue		Bedo : Here you may Drink			Bedo : One Cup		
Orchestral Sound							

Time (sec)	28	30	32	34	36	38	40
Scene							
Dialogue			Lawrence : You do not drink ?			Lawrence : I will drink when you do Bedo : I am Bedo	
Orchestral Sound	Trumpet ——— Harp String (Low Range)						

Emotional Graph		○		○		○		○		○		○

Time (sec)	42	44	46	48	50	52	54
Scene							
Dialogue							
Orchestral Sound	Woodwind Trumpet Brass Harp String						

Emotional Graph		•		•		•		•		•		•

The Lord of The Rings : Return of the King

Time (sec)	0	3	6	9	12	15	18
Scene							
Dialogue	Aragon : Legolas!!						
Orchestral Sound							

Woodwind

Brass ——

Trumpet

Low Brass

Percussion

Bass Drum ● ● ●

Timpani

High String

String ——

Low string

Emotional Graph								

Time (sec)	0	2	4	6	8	10	12
Scene							
Dialogue							
Orchestral Sound							

String

Emotional Graph								

88
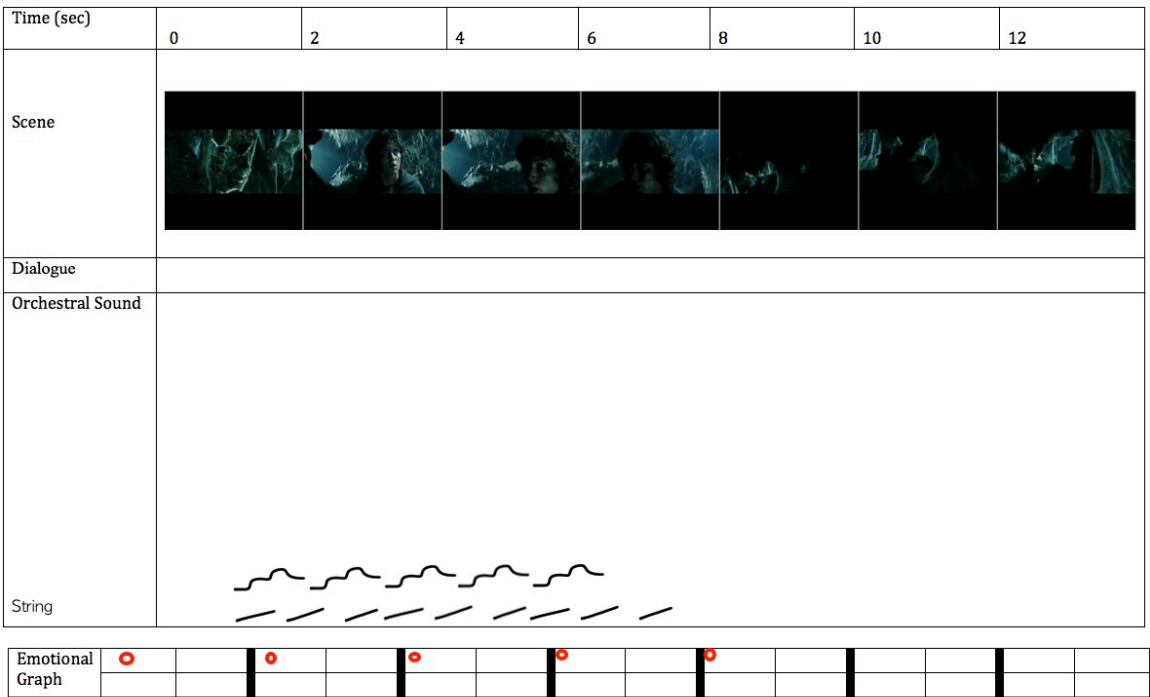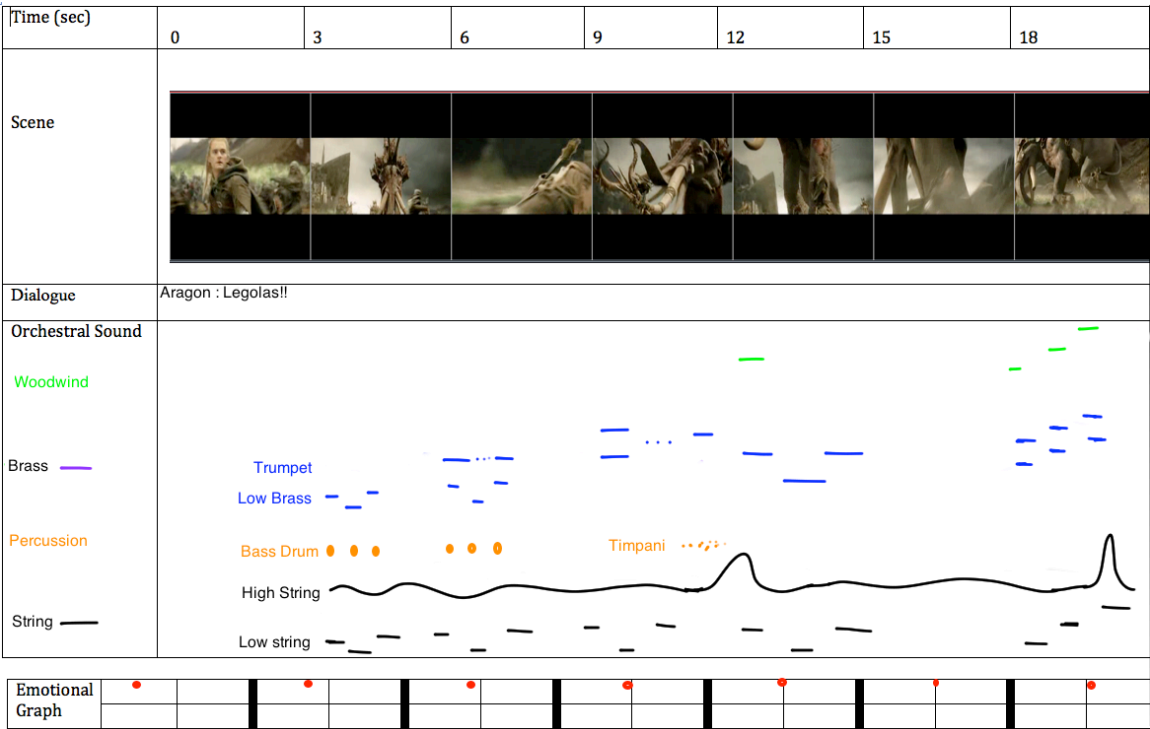
Pirates of the Caribbean : The World's End)

Time (sec)	0	2	4	6	8	10	12
Scene							
Dialogue							
Orchestral Sound							
String	Bass Drum						
Emotional Graph							