plausibility of Kuramoto's synchronisation model has been questioned and the self-organisation aspect, in particular in terms of stigmergy, is not present. It has thus been reworked here into a stigmergic model for oscillator synchronisation: local field coupling (LFC). The fields of chronobiology and biomusicology further elucidate oscillator synchronisation in living systems and the phenomena has been used to explain many forms of behaviours in those systems from their activity cycles to their development from birth to death. Even the animal origins of music have been suggested to arise out of synchronisation phenomena: a clearly rhythmic, but not necessarily creatively musical behaviour is achievable through synchronisation. This behaviour is termed protomusical.

This paper proposes that protomusical behaviour can be achieved through self-organised, stigmergic synchronisation, or in other terms: LFC. Crickets was developed to achieve low-level creativity through biologically inspired protomusical behaviour. This system is interactive and acts at Leman's microlevel of information processing [13], enabling the protomusical behaviour generated by the system to be reused in many applications across disciplines.

6. REFERENCES

2. INTRODUCTION
Walk With Me is a complex of topographic compositions performed by means of a smartphone-app, operating within and designed for predetermined environments. Technological developments have opened up possibilities to create compositions that are shaped into unique and personal electronic realtime musical experiences connected to a specific geographical area by the audience through the use of smartphones. New compositions are made for each environment. In this app, devised by Jeroen Strijbos and Rob van Rijswijk, the integrated use of GPS-triggered non-linear composition and realtime Digital Sound Processing (DSP) of environmental sounds, elements that are here combined for the first time, it creates a soundscape in public spaces. This soundscape changes for the individual listeners wearing earpieces with their movements around the area, and with chance events occurring in the area for which the app has been devised.

Figure 1. app icon

Figure 2. splashscreen app

WALK WITH ME - A WORK OF POINTLESS CURIOUSITY
Jeroen Strijbos Rob van Rijswijk

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The Netherlands

1. ABSTRACT
In this paper sound artists and composers Jeroen Strijbos & Rob van Rijswijk and programmer Niels Bogaards present a musical smartphone app they designed, which (using GPS data) adds layers of sound and music to a circumscribed area to be listened to via headsets: specific sound events are triggered by the position of a listener relative to spots within that area determined in advance by the artists. The article gives an outline of the effects and the workings of the app, which combines elements of composition and installation, and which they have so far adapted to a variety of areas.

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Figure 1. app icon

Figure 2. splashscreen app
Strolling around in the mind or over the face of the earth may lead to incomparably beautiful conceptions. Devising the Walk With Me app has been done in the same spirit of aimless walking and pointless daydreaming.

4. WALK WITH ME IN A CONTEXT OF LATTER DAY APPLICATIONS

Developments in hardware and software have made tools for storing and processing data smaller in size, more powerful and easier to use, to the point where hand-held pads and smartphones can perform operations for which institutions and companies needed sizeable rooms filled with noisy computers some forty years ago. The portable and versatile nature of contemporary processing devices, further enhanced by the functionality of their connection to the internet, facilitates their use on the go. These developments have led to the design of a number of applications.

- Mediascape, software developed by HP [2], uses GPS to trigger sound files. At ICMC 2008 David Drury presented his Mediascape composition Piece Lines. Mediascape had its origins in 2002 as Mobile Bristol, a project that explored how mobile devices and pervasive institutions and companies needed sizeable rooms filled with noisy computers some forty years ago. The portable and versatile nature of contemporary processing devices, further enhanced by the functionality of their connection to the internet, facilitates their use on the go. These developments have led to the design of a number of applications.

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Walk With Me redefines an environment on a sonic level by creating zones around selected spots. Using GPS these hotspots are fixed with a marker. Each location is linked to a certain mode of signal processing, which intensifies closer to the center of the zone around it. The effects used are reverb, tremolo, pitch shifting, delay and equalization. The result is a multi-layered, ever-changing sound piece that covers the entire area: some hotspots trigger prerecorded music or sounds; other hotspots trigger the processing of sounds picked up on the spot by the microphone of the smartphone (see Figure 4 and 5); zones around hotspots overlap (see Figure 6); because of the sonic transparency of the earpieces individuals walking with the app will hear sounds occurring around them.

As a composition Walk With Me plays on the idea of augmented reality, a merger of physical and virtual worlds. In Walk With Me different sonic worlds collapse into one acoustic reality. Strijbos and Van Rijswijk explored this earlier in their composition ‘Air Sensible’ for accordion duo and live electronics, in which they established a symbiotic relationship between the instruments and their electronic counterparts. Walk With Me puts the realtime processing tool in the hands of the audience. Their movements between specified spots in a delimited area trigger sound effects altering environmental sounds to a variable extent, depending on their position in relation to these spots.

Weaving their way through these spots the audience create sequences and patterns. The composers relinquish control, leaving it to the audience to decide on their ‘final’ version of the piece, which is in essence aleatoric. And consequently to undergo the surroundings that are the source of the basic material in a novel way. In this sense Walk With Me is not in itself a finished composition. Analogous to the conceptions of Baudelaire and Debord the art is in the act of walking around an area and listening to the sound events that emerge in it, part of them predetermined, part of them occurring by chance. It is the listeners who complete the composition.
comprise an experience for the audience, which they intend to be inspiring on an interactive and musical level. It should be artistically satisfying and user-friendly in its operation. It is a further development in their work, in which they have always combined (live) electronic and acoustic elements, and in which space has always been of central concern.

3. THE ART OF WALKING

In the 1960s the French philosopher and artist Guy Debord organized city walks that he called ‘dérives’: wanderings in which people were guided by their own intuition and by chance, shunning routes that city-planners would have them follow. These stroll were in themselves pieces of art, composed of confrontations with the unexpected and the undetermined.

About one hundred years earlier the French poet Baudelaire came up with the idea of the passionate observer, whose preferred environment is an endless perpetually moving crowd. The observer watches and wanders in which people were guided by their own daydreaming.

Devising the Walk With Me app has been done in the same spirit of aimless walking and pointless daydreaming.

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- Another application is the GPS audio game Demor [3] developed at the HKU (Utrecht School of the Arts, NL), which overlays an area with a sonic landscape full of adventure.
- There are examples of apps that process and play recorded sounds realtime, such as RJDJ [6] and Inception. These apps don’t use GPS.

What sets Walk With Me apart from the above applications is that it uses GPS to trigger sound files, realtime DSP of audio streams, both live and prerecorded (all of these in combination); that it uses digital musique concrete elements in realtime; and that it uses DSP and GPS with environmental sounds. The app and its serverside infrastructure were developed by Elephantcandy.

5. STROLLING LISTENERS COMPOSE AUGMENTED REALITY

Walk With Me redeline an environment on a sonic level by creating zones around selected spots. Using GPS these hotspots are fixed with a marker. Each location is linked to a certain mode of signal processing, which intensifies closer to the center of the zone around it. The effects used are reverb, tremolo, pitch shifting, delay and equalization. The result is a multi-layered, ever-changing sound piece that covers the entire area: some hotspots trigger prerecorded music or sounds; other hotspots trigger the processing of sounds picked up on the spot by the microphone of the smartphone (see Figure 4 and 5); zones around hotspots overlap (see Figure 6); because of the sonic transparency of the earpieces individuals walking with the app will hear sounds occurring around them.

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6. CONCLUSION

Site-specific sound art has been around for several decades, but now developments in technology can have individual listeners walk along a self chosen path within a composed sound environment. The Walk With Me app [7] has been operational since 2011, and has been devised for numerous places, such as Berlin, London and the Liberation Route. This new combination of GPS, realtime processing of both ambient sound and composed files, and the unique characteristics of smartphones has opened a vast area of new possibilities for contemporary composers. And it does invite new additions using a whole array of parameters, from strength of light to the intermediate distance between users of the app.

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Figure 6. site-specific hotspots

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