



# Brain Computer Music Interfacing For Stress Management

**Krisztián Hofstädter**

Email: krisztian.hofstadter@anglia.ac.uk

Supervisors: Dr Tom Hall and Prof Jörg Fachner

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## Neuro-Feedback and Music Therapy

This research develops a biofeedback system for stress management. It uses the combined benefits of neuro-feedback (NF) and music therapy to develop Brain Computer Music Interfacing software compatible with consumer level electroencephalography (EEG) hardware. While the use of biofeedback has been well documented in the arts, it is a promising interdisciplinary area to probe for therapeutic purposes located within music. Investigation is necessary, as firstly, effective stress management has been demonstrated in numerous music therapy as well as neuro-feedback studies yet there has been little investigation in their combined therapeutic use. Secondly, existing NF software mainly focus on giving visual feedback and when there is sound, it usually neglects the healing capabilities of music.

## Computer-aided compositions

The software's effectiveness is investigated in training programmes to evaluate various compositional techniques and musical elements. The most effective musical repertoires will be implemented in an extensive trial period, where the outcome is demonstrated in real-time computer-aided compositions using traditional instruments. The prototype used currently for tests works with Neurosky hardware and SuperCollider software with InScore for notation.\*

## Understanding consciousness

This research will create software, creative work and a new concept of NF with music for stress management. The outcome will show whether it is possible to employ the developed software effectively beyond its use in creative arts as a tool for developing self-awareness of one's states of mind. The proposed software is cross-platform and compatible with a variety of EEG hardware. Its user-friendly operation allows not only specialists but also the wider public to develop better control of their central nervous system activity and understand more of their consciousness.

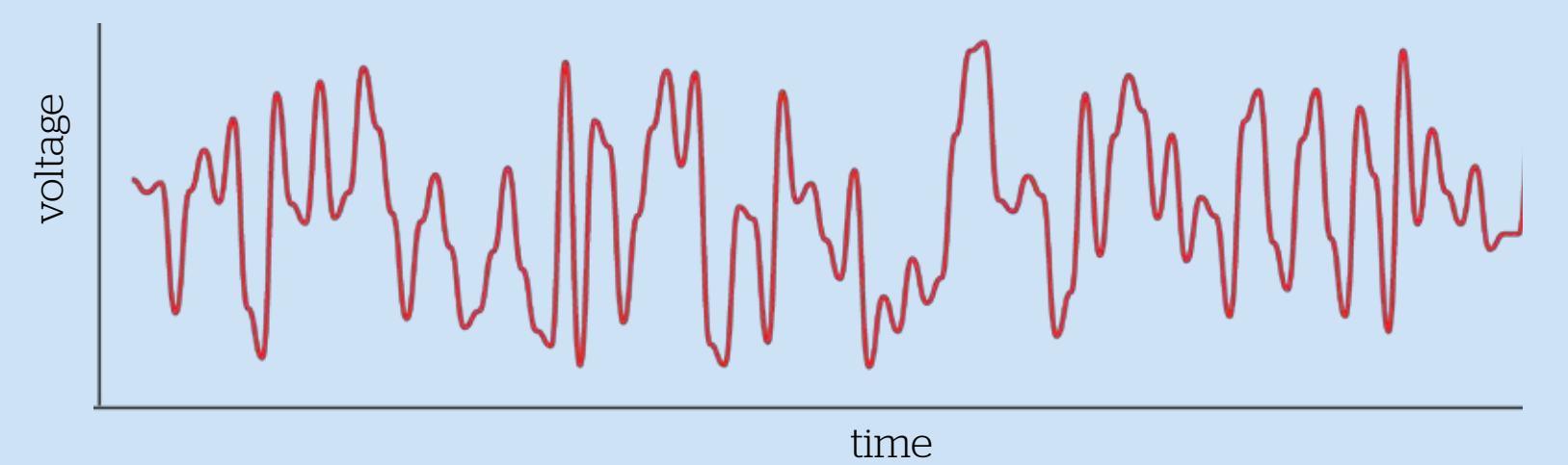
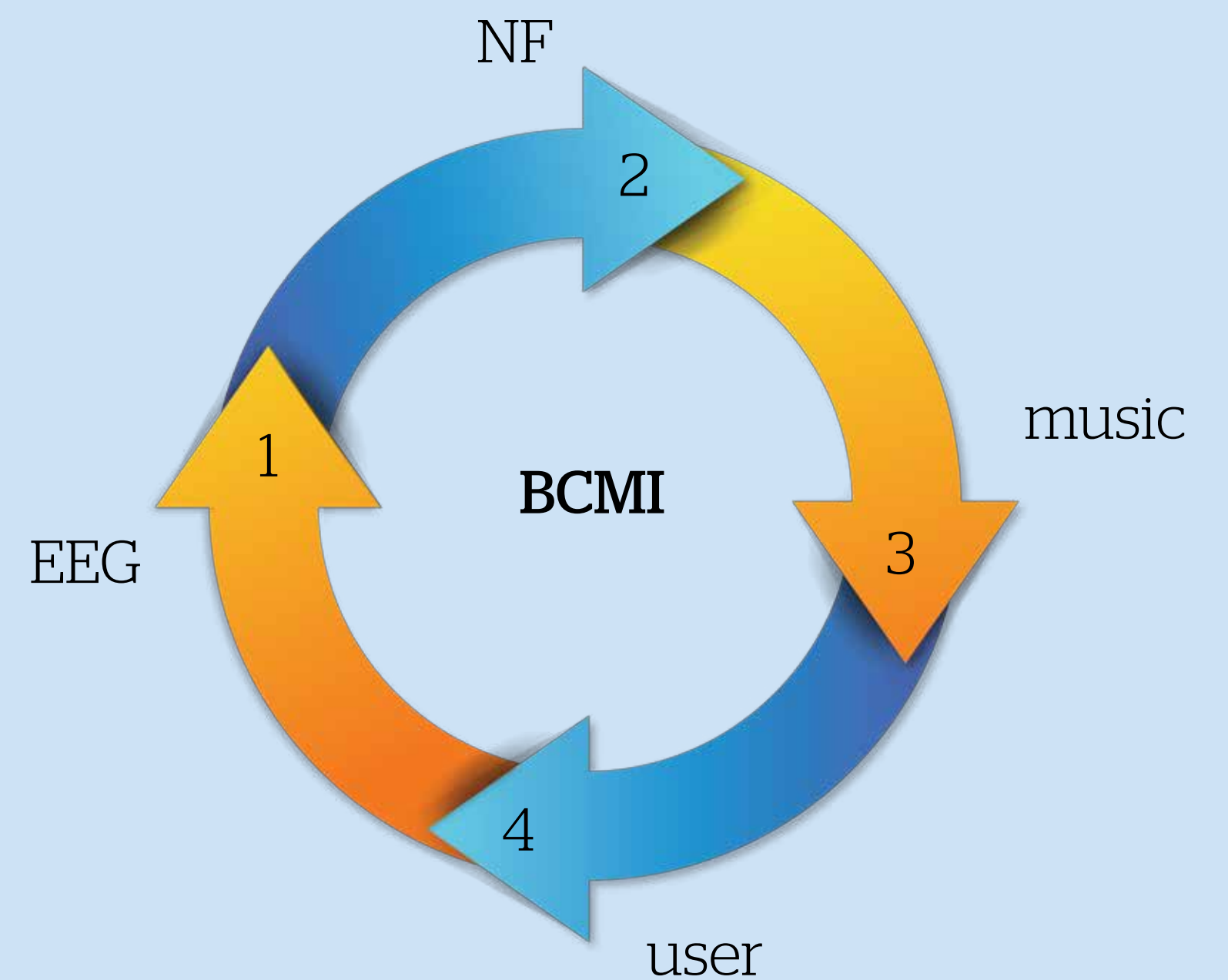


Fig 1. Raw EEG measured on user in real-time

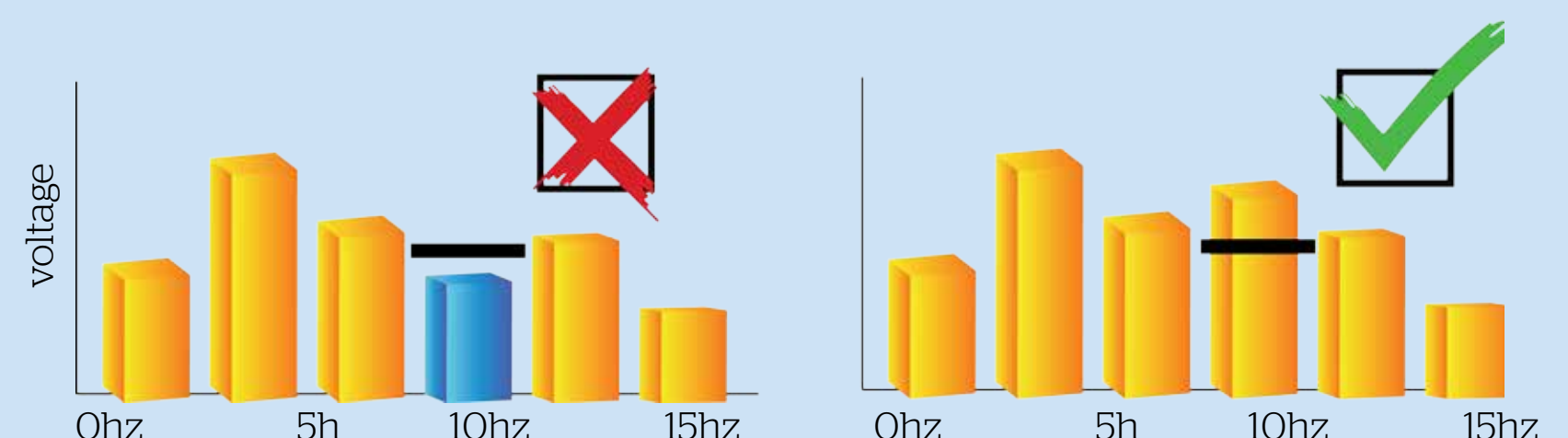


Fig 2. Triggers on spectral data evolving music patterns

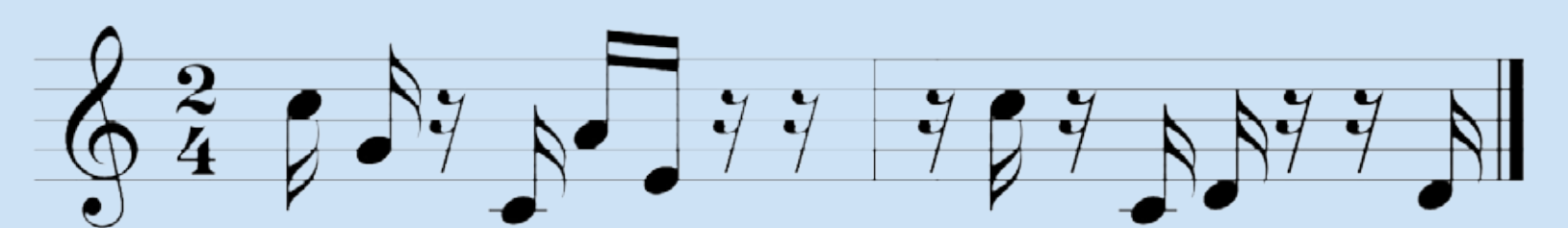


Fig 3. Music synthesised and notated digitally



Fig 4. Digital notation played by user on instrument

\* InScore class for SuperCollider is developed by Dr Richard Hoadley. Further development will use Emotiv /OpenBCI and JUCE, (C++).