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Music Informatics Research Group (MIRG)

<http://mi.soi.city.ac.uk/>



Music Informatics Research Group (MIRG)

- Formed in 2005
(succeeded the “Centre for Computational Creativity”)
- Members:
 - Tillman Weyde (Group leader & Senior lecturer)
 - Emmanouil Benetos (Research fellow)
 - Daniel Wolff (Research student)
 - Reinier DeValk (Research student)
 - Srikanth Cherla (Research student)
 - Andreas Jansson (Research student)
 - Olivier Ruello (Intern)
 - Antoine Winckels (Intern)



Music Informatics Research Group (MIRG)

- **Research Activities:**
 - Music information retrieval
 - Music signal analysis
 - Computational musicology
 - Music knowledge representation
 - Applications
- **Funding:**
 - I-MAESTRO
 - SLICKMEM



Music Signal Analysis

- Multi-pitch detection, instrument identification, source separation...
- Application: automatic music transcription

Violin

$\text{♩} = 60$

- Example: Original audio: 🗣️ Synthesized transcription: 🗣️

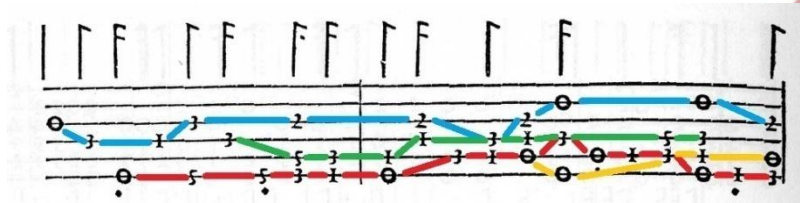
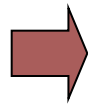


Recognition of polyphonic structure and automatic transcription of lute tablature

Lute tablature: no indication of polyphonic structure



Extraction of individual voices using machine learning techniques



Transcription into modern music notation



Music Analysis & Prediction with Neural Networks

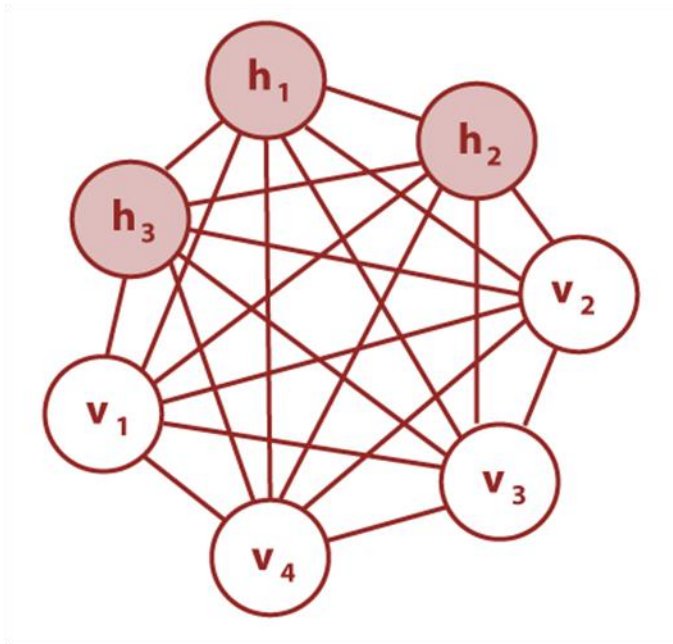


Image Courtesy, en.wikipedia.org

- Statistical & probabilistic views on music cognition
- Music, cognitive science and machine learning
- Understanding
 - Similarity & Style
 - Creativity
 - Familiarity and Preference
- Music generation

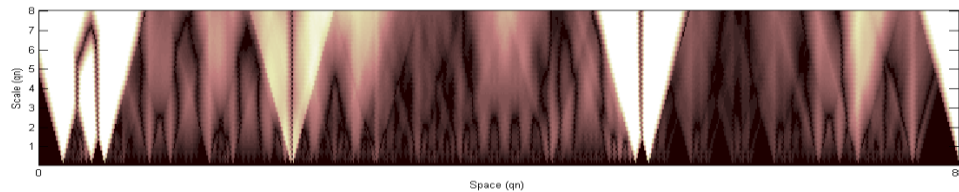
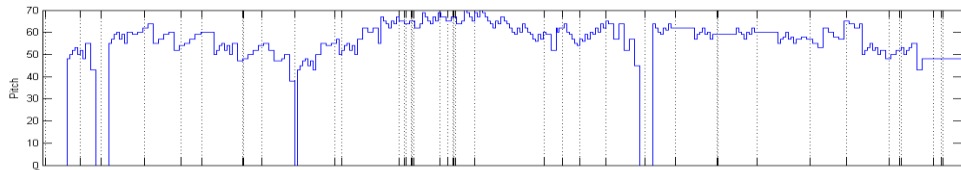
Generative music example: 



Modelling Melodic Similarity

Wavelet Representation for Classification

- Mathematical models for analysing signals
- Allows for analysis at different time-scales
- Works well for recognising similar melodic fragments

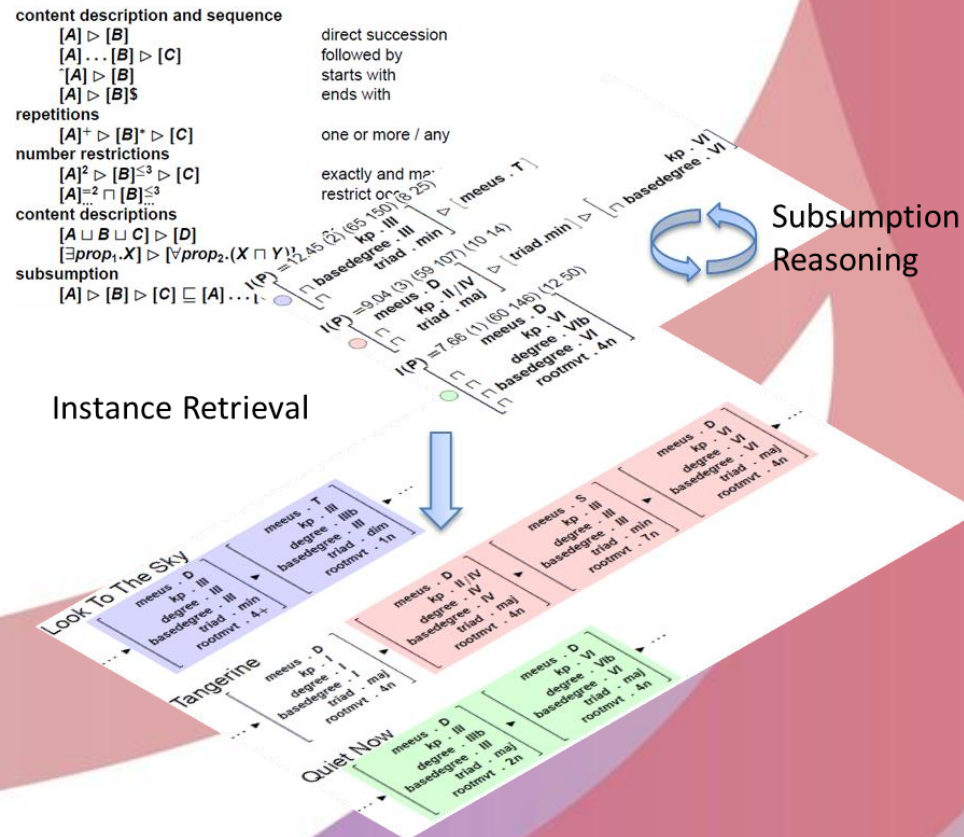
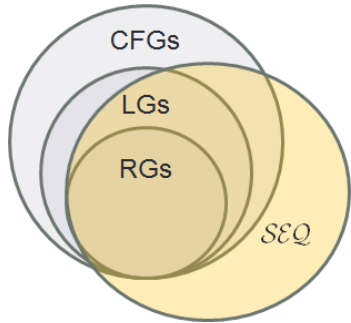




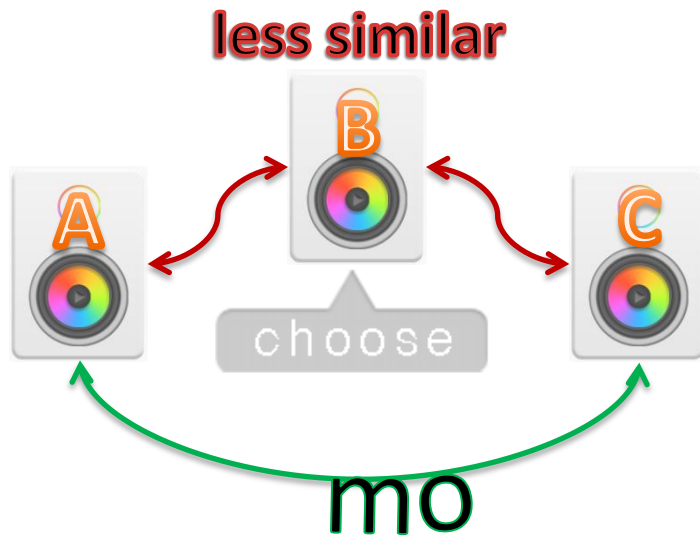
Representing Musical Structure in the Semantic Web

Sequences in Description Logic:

- SEQ representation for sequences (melodies, chord progressions) in description logic
- SEQ ontology in OWL
- Extends semantic music search and reasoning



Music Similarity Modelling



Music Similarity

- Complex concept but important for **music recommendation** and **retrieval**
- Depends on many factors
 - **context, culture, psychoacoustics ...**

Computational Similarity Models

- **Weight** different **aspects** of music:
 - Which **features** are important?
 - Music perception + Musicology

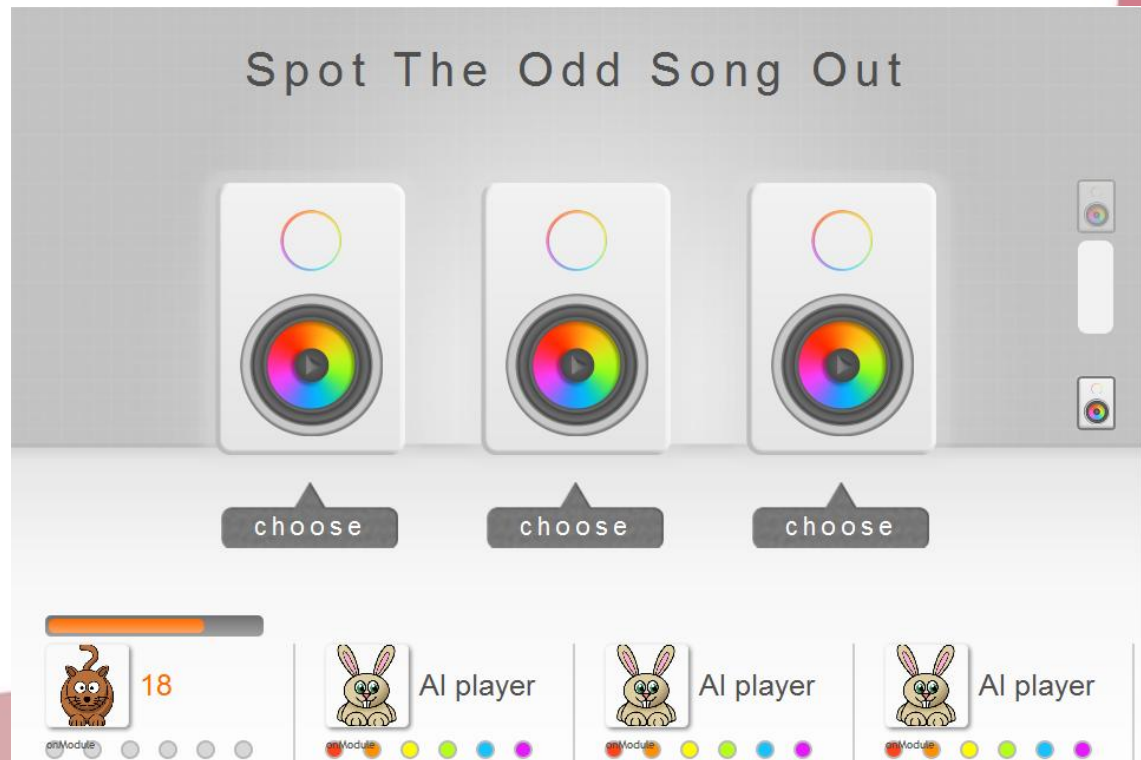


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Data Collection with Games (With A Purpose)



mi.soi.city.ac.uk/camir/game/



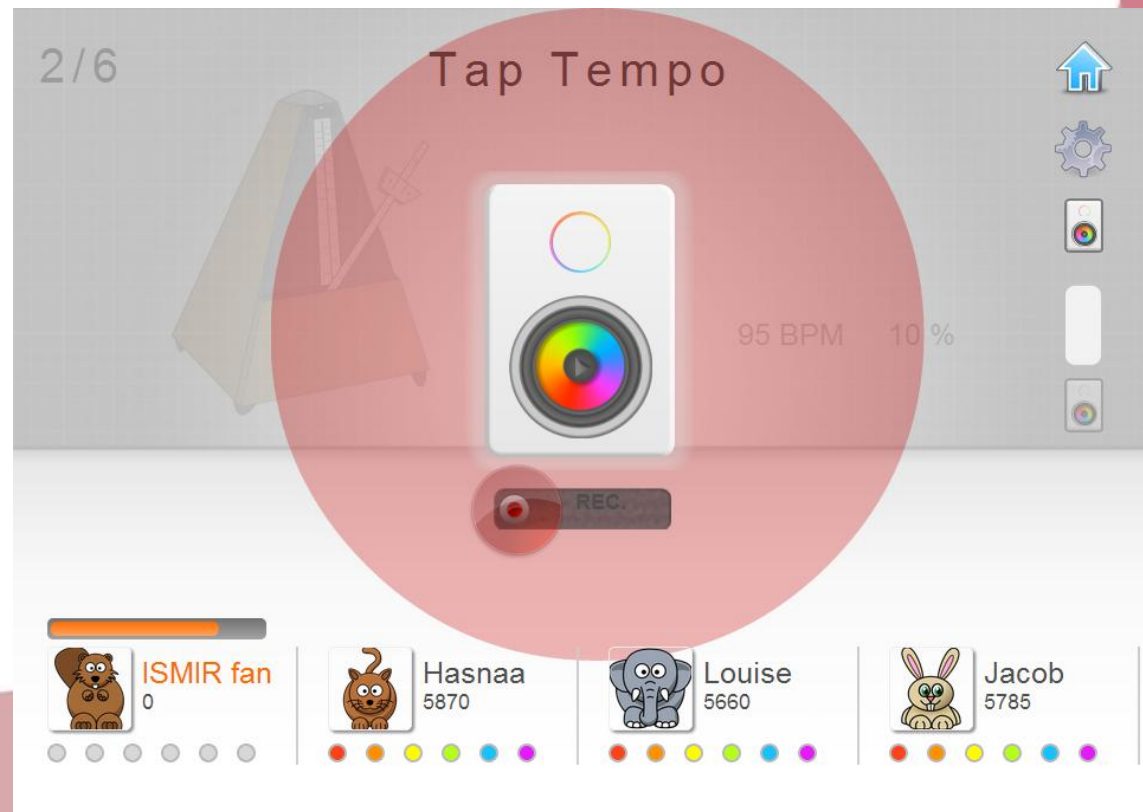


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Collaborators welcome!

We would like to keep in touch with:

- App developers - interesting app ideas
- Musicians - creative feedback
- Educators - explore application to music education
- Researchers - technical suggestions and discussion

Visit <http://mi.soi.city.ac.uk> for more info