Durham University

Introduction to Music Computing

Module introduction

COMP3721 Introduction to Music Computing (25/26)

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Welcome

	Dr Eamonn Bell	**Dr Robert Lieck**	**Megan Finch**
Office	MCS 2105	MCS 2106	
Office hours	Email for appointment	By appointment or directly after lecture	By appointment
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Module overview

- **20 Credits**
- **Lectures**
  - 20 weekly lectures, starting
  - MF (~ 5 weeks), EB (~ 5 weeks), RL (~ 10 weeks)
  - All lectures: Tuesday, 10 a.m. - 11 a.m. @ MCS2068

  Practicals
  - Weekly practicals starting **on the second week of each term**
  - All practicals: Thursday, 9 a.m. - 11 a.m. @ MCS3097

Module overview

- **Assessment**
  - Coursework – outline and then full: short screencast submission, code, and accompanying technical report (100% = 10% + 90%)
    - **Coursework (outline and full) spec released 31/10/2025***
    - **Outline due 19/02/2026 (10%)**
    - **Final submission 19/03/2026 (90%)**
- **Readings**
  - [FMP21] Müller, M. (2021). Fundamentals of Music Processing: Using Python and Jupyter Notebooks. 2nd ed. Germany: Springer.
    - Available as an e-Textbook at Durham University Libraries
  - Reading List on Talis Aspire (via Ultra) for further suggestions

Course materials and MuProcDurham repo

- **MuProcDurham**
  - https://github.com/MusicComputingDurham/MuProcDurham
  - GPL-3.0 licensed Python package for the Music Computing lecture and practical materials
  - Released to PyPI (pip install MuProcDurham)
  - Documented here: https://musiccomputingdurham.github.io/MuProcDurham/
- **General principle**
  - Blackboard Learn Ultra will link to public GitHub repo, which contains the latest version of the slides, practical notebooks, and any other assets

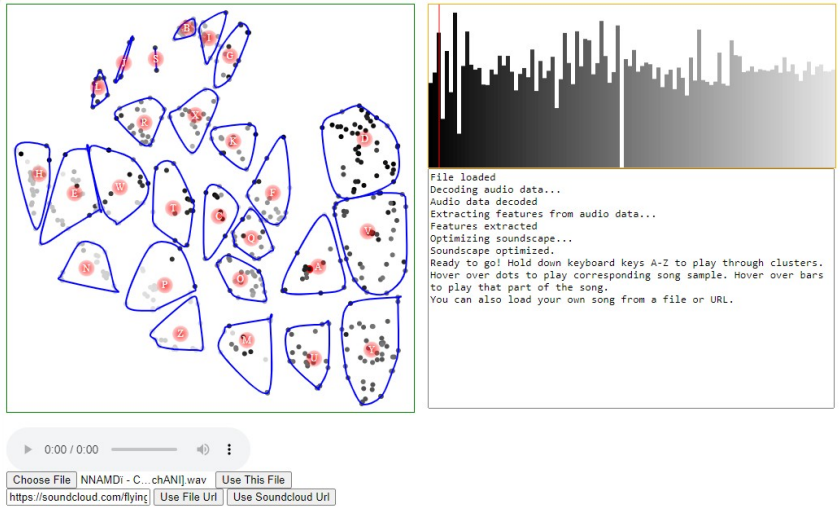
Other practicalities

- You will need headphones with a 3.5mm jack for use during practicals
  - Please contact EB or RL if you cannot get access to this before first practical (any model will do)
- No prior musical knowledge is assumed
  - Don’t hesitate to ask if you are unsure what something means
- Many examples will be drawn from the diatonic tonal tradition (classical, pop) common in – but not exclusive to – Western music
  - But the techniques can very often be generalised

Topics

- Topic 1 – Processing music data (~ 8 weeks, MF, EB)
  - principles of digital audio; sampling theorem; theory and application of Fourier transform to audio data; high-level audio features; representing pitch and pitch classes; representing rhythm; representing harmonic function
    - **Please revise**: complex numbers, vector arithmetic, scientific Python (NumPy array basics)
- Topic 2 – Computational models of music (~ 8 weeks, RL)
  - (hidden) Markov models of melody and harmony; probabilistic context-free grammars of harmony and rhythm; neural models
    - **Please revise**: statistics and probability
- Special topics (EB, RL, and guests) – Music and emotions (24/25), Ethics and bias in MIR, Iterated learning (24/25), History of MIR (24/25)

Motivating example



MusicMapper

https://fatsmcgee.github.io/MusicMappr/

Benjamin, Ethan, and Jaan Altosaar. “MusicMapper: Interactive 2D Representations of Music Samples for in-Browser Remixing and Exploration.” In Proceedings of the International Conference on New Interfaces for Musical Expression, edited by Edgar Berdahl and Jesse Allison, 325–26. Baton Rouge, Louisiana, USA: Louisiana State University, 2015. https://doi.org/10.5281/zenodo.1179018.

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