1. Course Intro

Generative Algorithms for Sound and Music

Universitat Pompeu Fabra Barcelona

MTG Music Technology Group

Valerio Velardo

- Founder @ Transparent Audio
- AI music consultant
- Host @ The Sound of AI
- Founder @ Melodrive
- Head of MLOps @ Utopia Music
- Musician + AI + programmer
- PhD in AI music


Part 1
Symbolic
Part 2
Audio


Part 1
Symbolic
Part 2
Audio

Teaching Assistants (Part 1)

Fernando Garcia de la Cruz

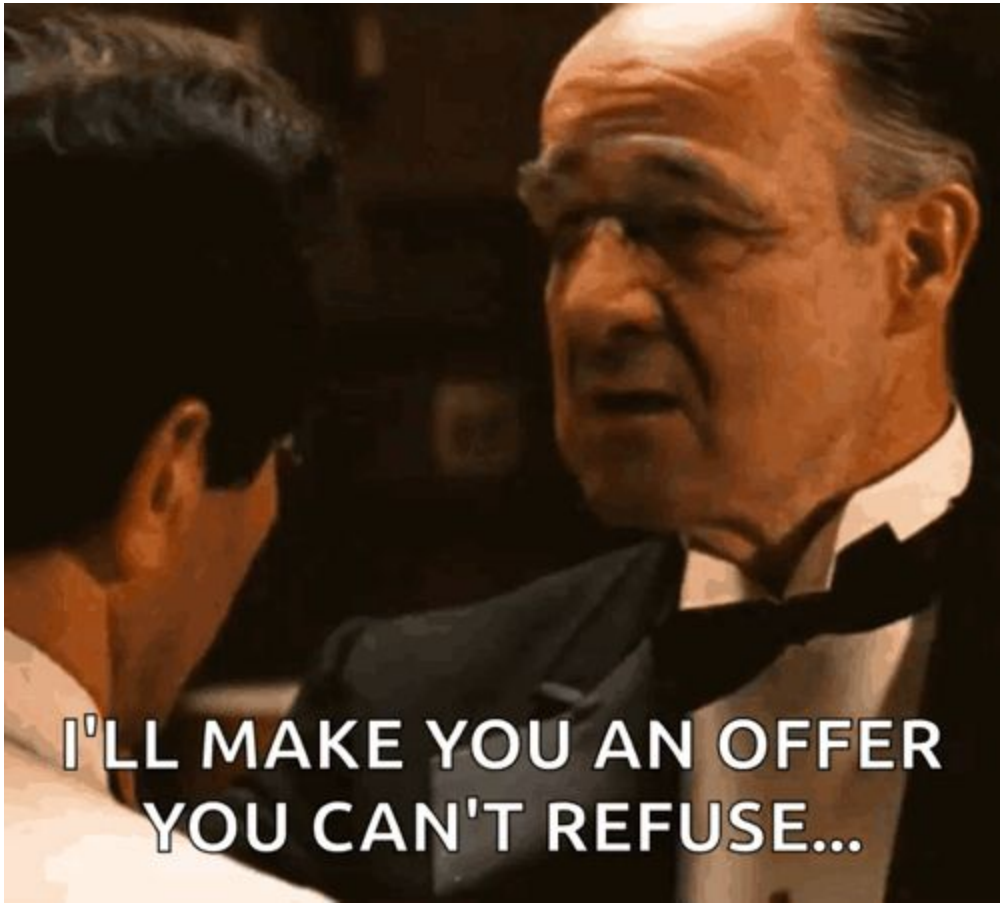
Andreas Papaeracleous

Overview

1. Part 1 (Valerio)
2. Part 2 (Lonce)
3. Activities

1. Part 1

Website


I'LL MAKE YOU AN OFFER
YOU CAN'T REFUSE...

You **give** 110% of your commitment, and effort

You **get** the mindset
+ skills to be hired as
a gen AI mus
engineer

TOUGH

TOUGH

EXCELLENCE

Design, implementation, and critical evaluation of symbolic music generation systems

Things you'll learn

- Work with symbolic music data

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- Design end-to-end generative music systems

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- Evaluate gen music with multiple metrics
- Genetic algorithms and transformers
- Real-world challenges + tips
- Use and fine-tune symbolic models with Hugging Face's Transformers

Teaching approach

- Theory + practice
- Learn by doing
- Proactive + independent learning

Classes

- Theory
  - Planning end-to-end gen music project
  - Genetic Algorithms
  - Transformers

Classes

- Theory
  - Planning end-to-end gen music project
  - Genetic Algorithms
  - Transformers
- Practice
  - Hugging Face Transformers
  - Assignments
  - Final project presentation


TRADITIONAL CLASSES
FLIPPED CLASSES
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V + F + A

in this course

You
in this
course

Before theory classes (GAs, transformers)…

- Watch videos / read papers
- Learn theory
- Code along with tutorials
- Do quiz

What happens if you don’t do pre-class chores?

What we'll do in theory classes

- Recap
- Go deep (industry, challenges)
- Activities / reinforcement learning

Generative Music AI

THE SOUND OF AI

Tools

Quizzes

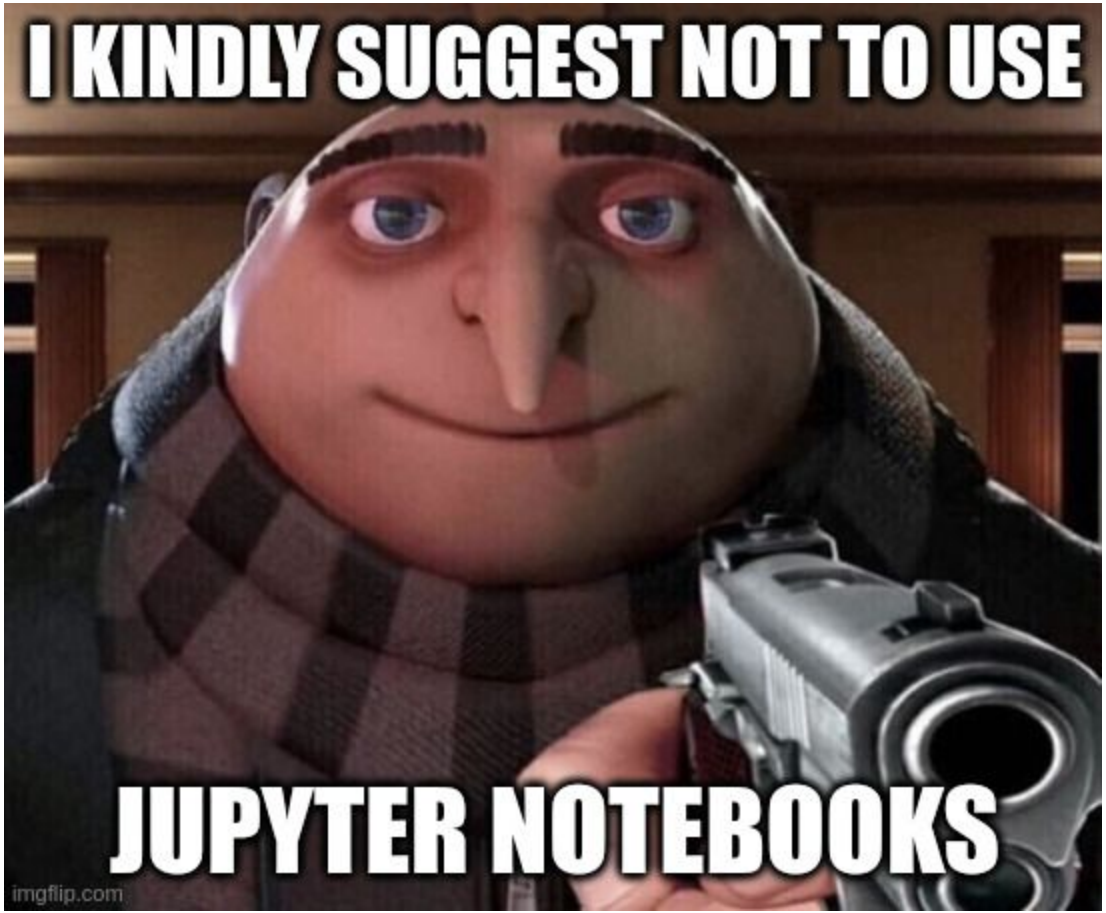
- 2 pre-class quizzes (1 per technique)
- Open 12 noon day before the class
- Close 12 noon day of the class

Coding assignments

- 2x assignments
- Deadline: Feb 15th at midnight
- Teams:
  - 3-4 people
  - Same for all assignments

Assignments: Deliverables

- Use dedicated Github Classroom
- Include *requirements.txt* to install package
- Presentation


I KINDLY SUGGEST NOT TO USE
JUPYTER NOTEBOOKS
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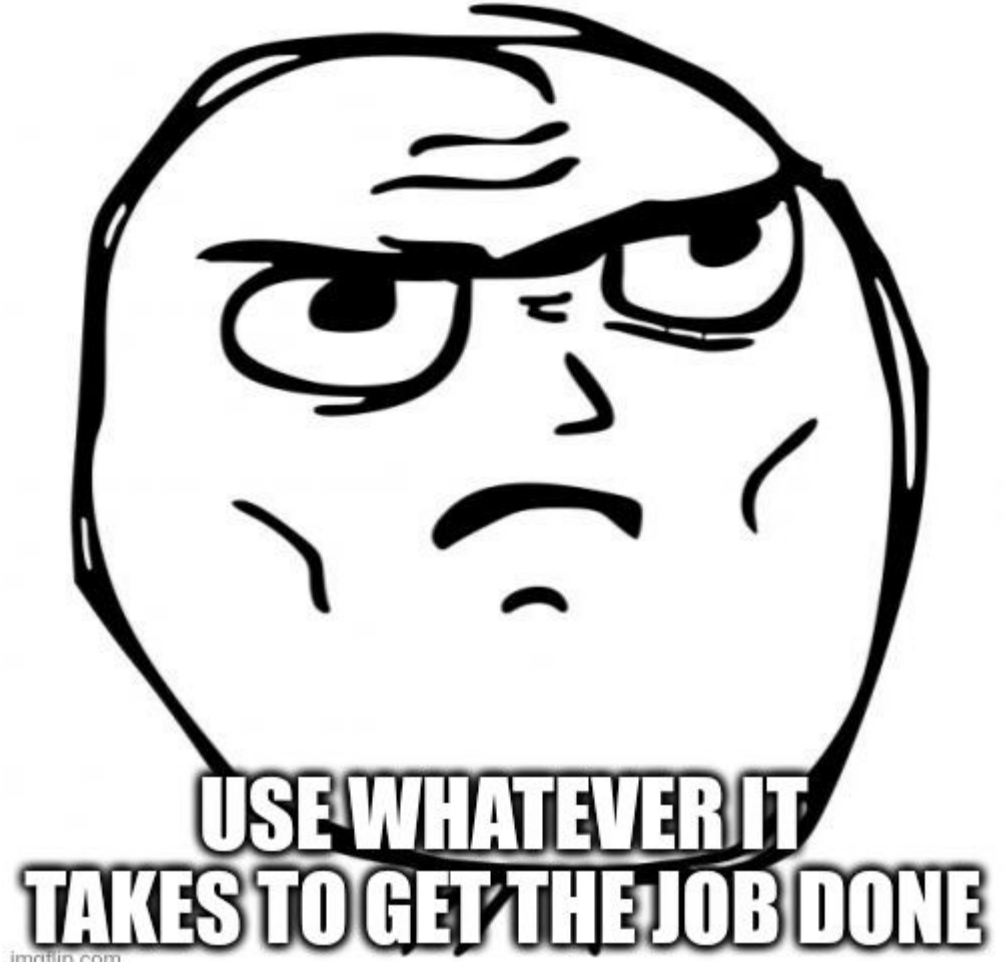
Final project

- What it is
  - Symbolic generative music system
  - Generates music in semi-realtime, sonified through a DAW
- Same team as code assignments
- Deadline: 16th of Feb at midnight

Final project: Deliverables

- Code in GitHub Classroom
- Presentation on Feb 17th


USE WHATEVER IT
TAKES TO GET THE JOB DONE
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Course evaluation

- Part 1: 50%
- Part 2: 50%

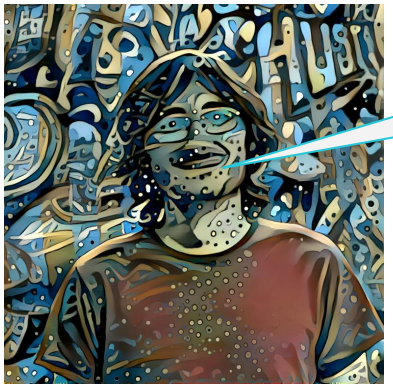
Part 1 evaluation

- Pre-class quizzes: 10%
- 2 code assignments: 40%
- Final project: 50%

Communication

- #smc25-musicgen on MTG Slack
- DM @Valerio Velardo, @AndreasP, @Fernando on MTG slack

You can book 15’ sessions with me on *cal.com*. Individuals or groups.



Valerio

Yo, you can book office hours also with us! Send me a DM on the MTG Slack.

Next action points for you

1. Register teams of 3-4 in this Google spreadsheet
2. Sign up to both assignments via these links
    - Assignment 1
    - Assignment 2
3. Genetic Algorithms:
    - Watch videos (15, 16)
    - Do quiz

3. Part 2 (Lonce)

4. Activities

Let’s know each other…

1. Why are you here?
2. What excites you about gen mus?


BRACE YOURSELF
GENERATIVE MUSIC IS COMING
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