

# 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**

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**Audio**



# Teaching Assistants (Part 1)

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Fernando Garcia de la Cruz



Andreas Papaeracleous

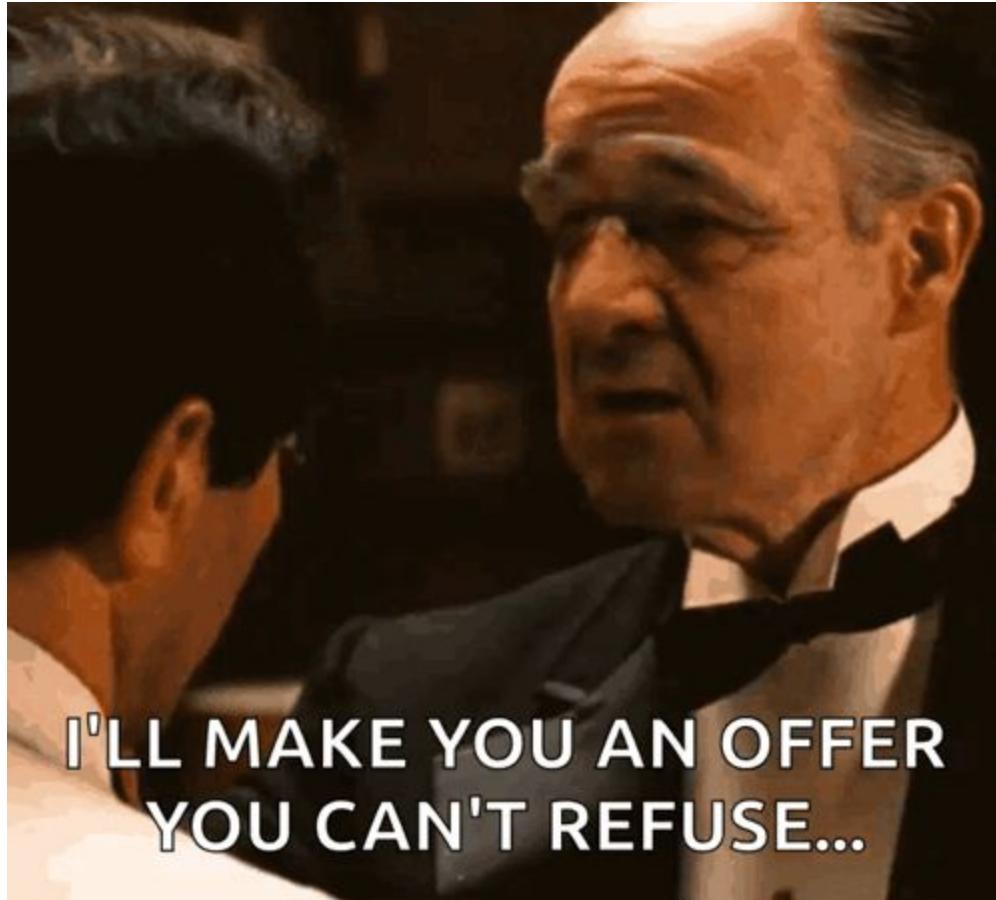
# Overview

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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**

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**EXCELLENCE**

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

# Things you'll learn

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- Work with symbolic music data

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- Work with symbolic music data
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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

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



# Classes

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

# Classes

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



**TRADITIONAL  
CLASSES**



**FLIPPED  
CLASSES**

V + F + A

in this  
course



ViralHog

You  
in this  
course



ruinedchildhood

# Before theory classes (GAs, transformers)...

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- 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

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

# Generative Music AI

THE  SOUND OF AI

# Tools

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# Quizzes

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

## Coding assignments

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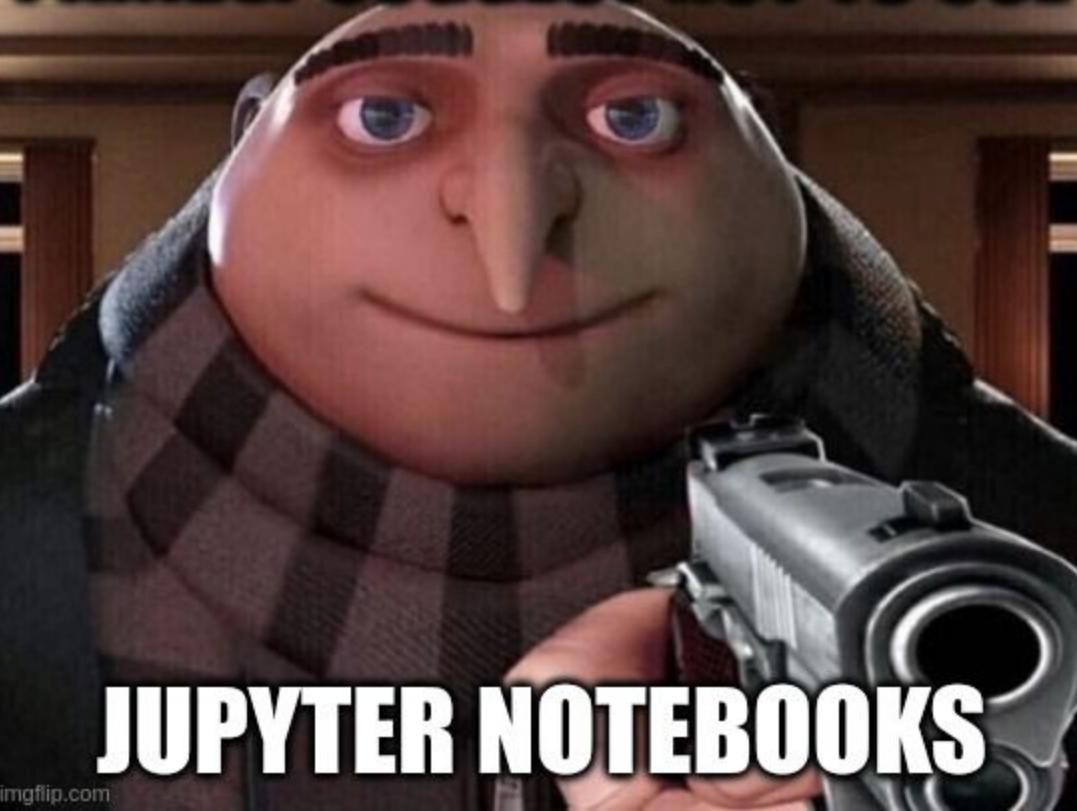
- 2x assignments
- Deadline: Feb 15th at midnight
- Teams:
  - 3-4 people
  - Same for all assignments

# Assignments: Deliverables

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

I KINDLY SUGGEST NOT TO USE



JUPYTER NOTEBOOKS

# Final project

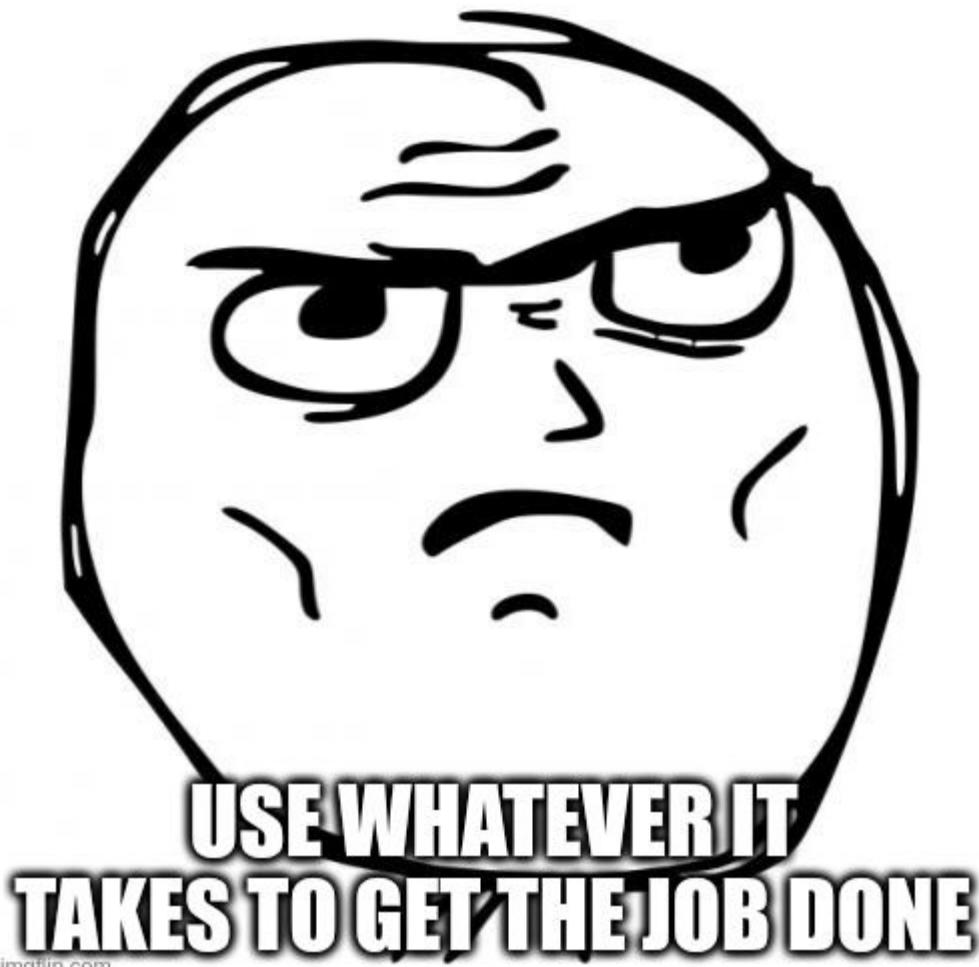
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- What it is
  - Symbolic generative music system
  - Generates music in semi-realtime, sonified through a DAW
- Same team as code assignments
- Deadline: 16th of Feb at midnight

# Final project: Deliverables

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- Code in GitHub Classroom
- Presentation on Feb 17th



# Course evaluation

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

# Part 1 evaluation

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

# Communication

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- #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

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

# 3. Part 2 (Lonce)

# 4. Activities

# Let's know each other...

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

**BRACE YOURSELF**



**GENERATIVE MUSIC IS COMING**