

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



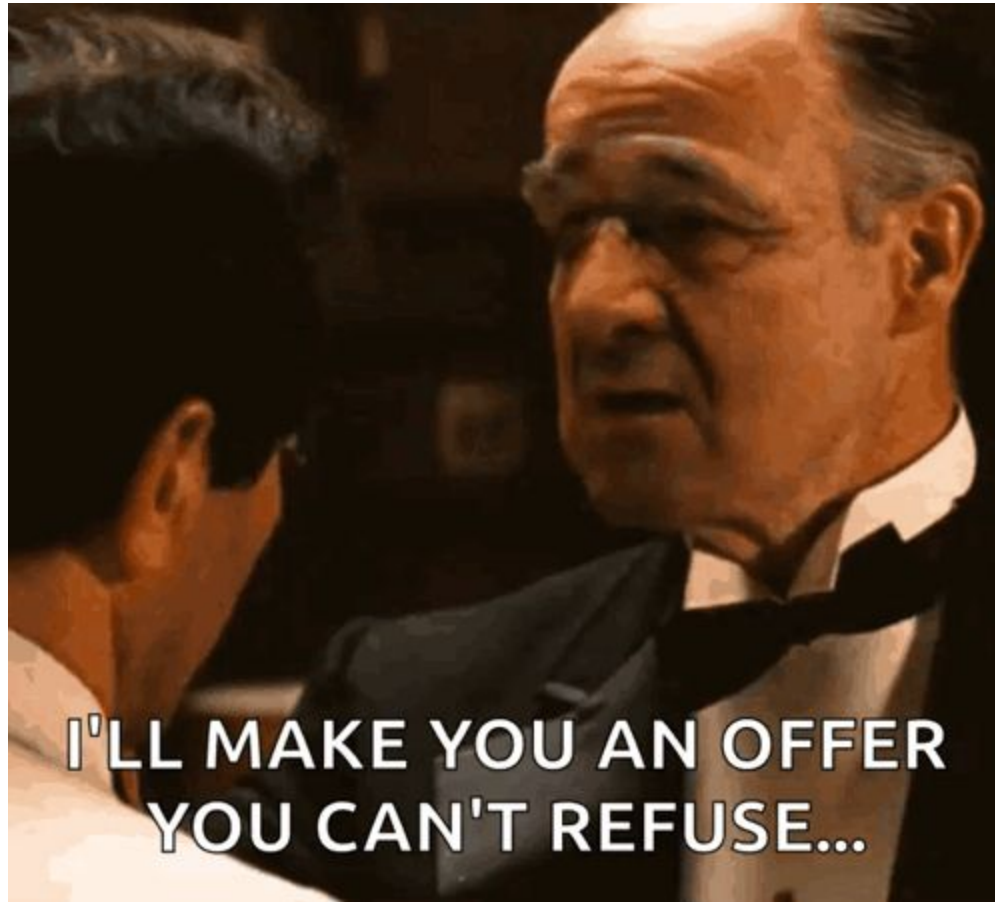
Andreas Papaeracleous

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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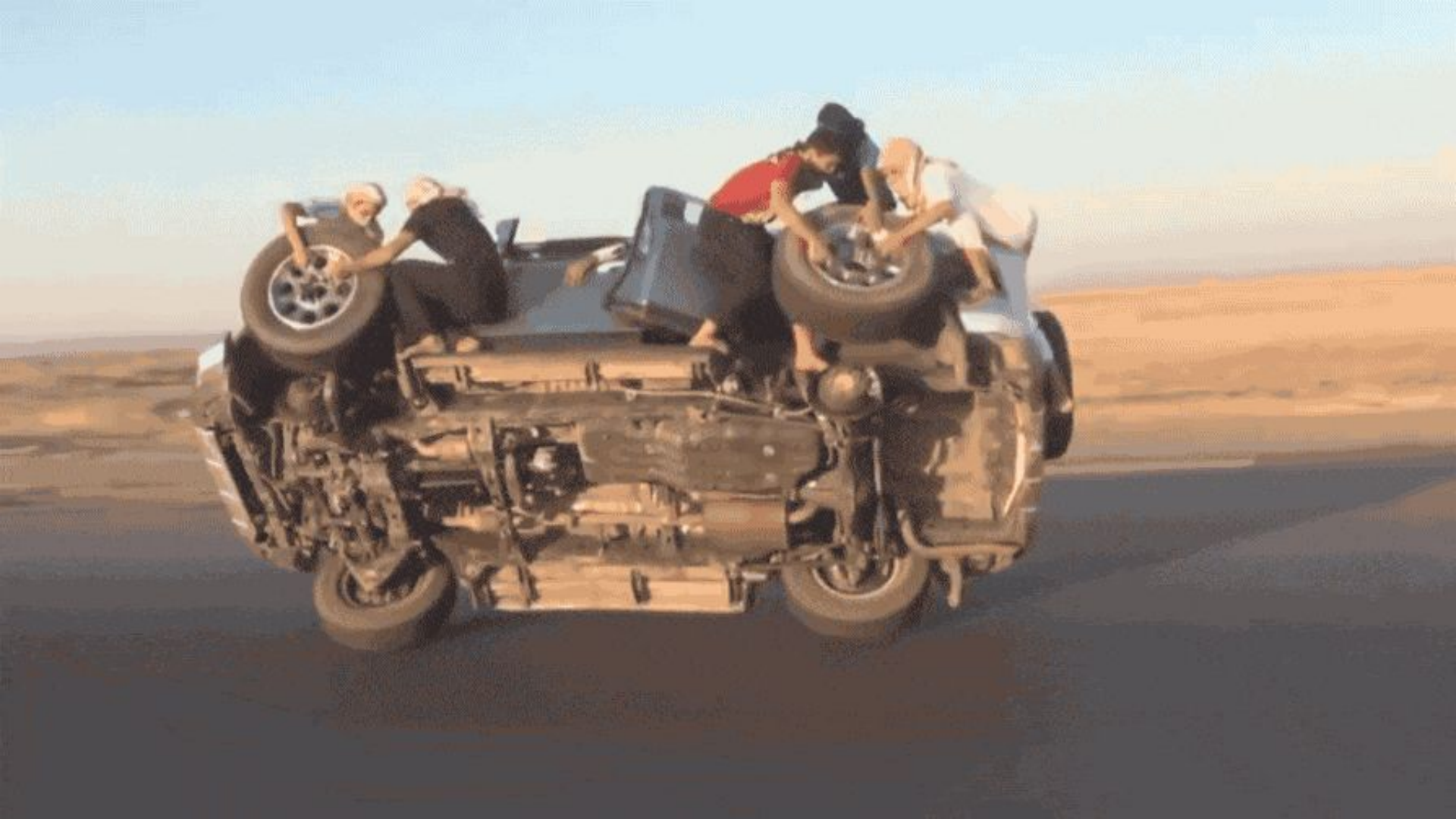
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- Genetic algorithms and transformers
- Real-world challenges + tips

Things you'll learn

- Work with symbolic music data
- Design end-to-end generative music systems
- 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**

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

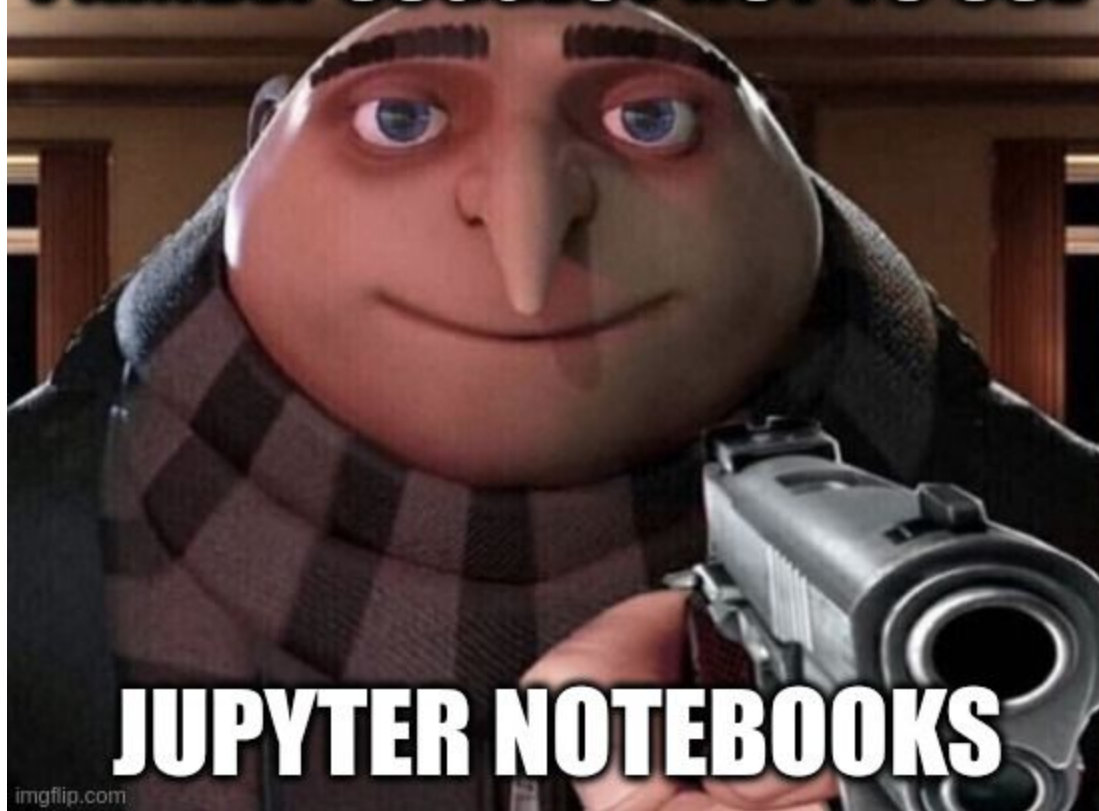
Coding assignments

- 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



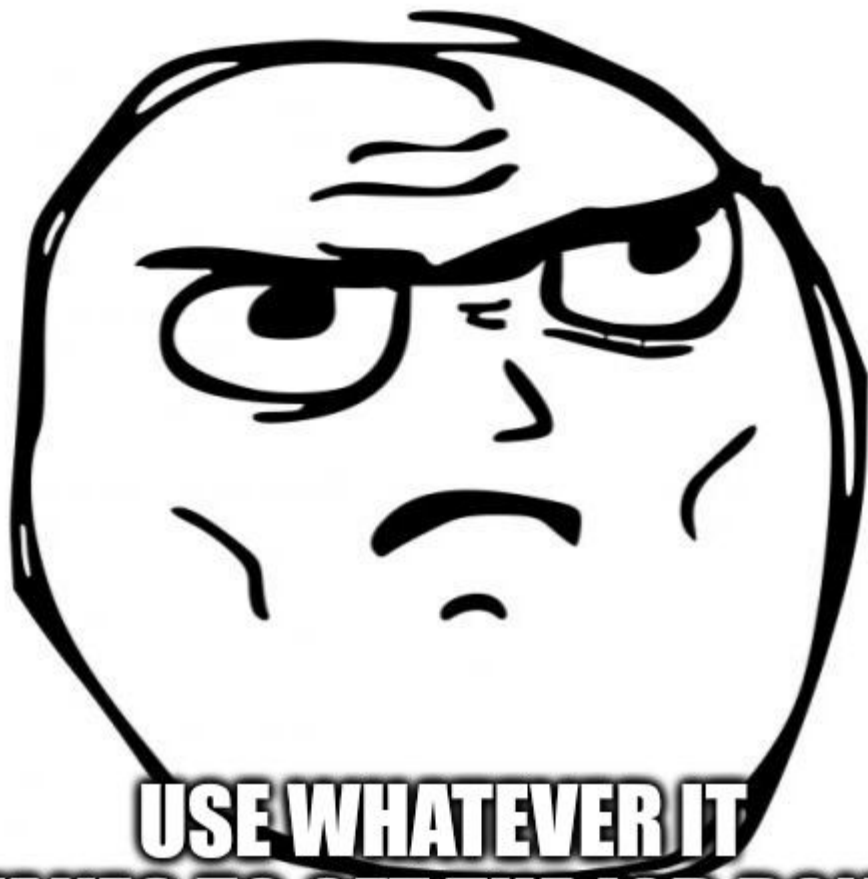
JUPYTER NOTEBOOKS

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**

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