# Melodic Chains

## Music Generation using Markov Chains

REOF-MAS

# Goal of the project

- Algorithmic composition using Markov chains from MIDIs
  - Current focus on classical music, possible extention to Classical vs Modern (Remix)

- Something definetly NOT mere generation
  - Agents collaborate to generate valuable/novel/surprising artefacts
  - Robust evaluation methods

# Objectives – Environment setup

- Repository setup ✓
  - Source and Documentation separation, all works fine..
- Virtual environment ✓
- 3rd Party Library Installations ✓
- Boilerplate structure of project ✓
  - Thanks to Creamas

# Objectives – Inspiration set, MCs

- Parsing compositions from MIDI files ✓
  - Music21 library and some problems and manual installation ☹
  - Classical music composers using similar keys e.g. Bach
    - C Major, simple, no sharp, no flat
- Representation of the musical composition is HARD!
  - There are many variables to consider:
    - Note, duration, pitch, motif, chroma, key, loudness, mode, tempo, timbre ... and possibly more.
  - Current FOCUS (one step a time) ✓
    - Markov Chain states = Note & Duration ✓
    - Transformational creativity - mutable chains

# Objectives – Artefact Evaluation

- By Agents – (ComposerAgent, AudienceAgent, CoordinatorAgent?)
  - Value: Zipf's Law (Monterey Mirror, Manaris et al.) ✓
  - Novelty: String comparison methods, pseudo-likelihood?
    - Pitch interval, note duration, similarity score ...
  - Possible different method to measure surprisingness (Auidience Agent)

- By Human judges (external feedback)
  - After some iterations evaluate the artefact and transform it accordingly
  - Still under consideration

# Possible Improvements

- There are endless possibilities...
- Preprocess - Select what you need from MIDIs!
  - Staccato filter, Allegro filter ...
  - Avoid repetitive patterns (let the agents select different states – mutate)
- Setting a theme
- Hard-coded rhytms
- LIMITED TIME – reconsider wisely

  ...

Any questions/suggestions?