# Melodic Chains

## Music Generation using Markov Chains

REOF-MAS

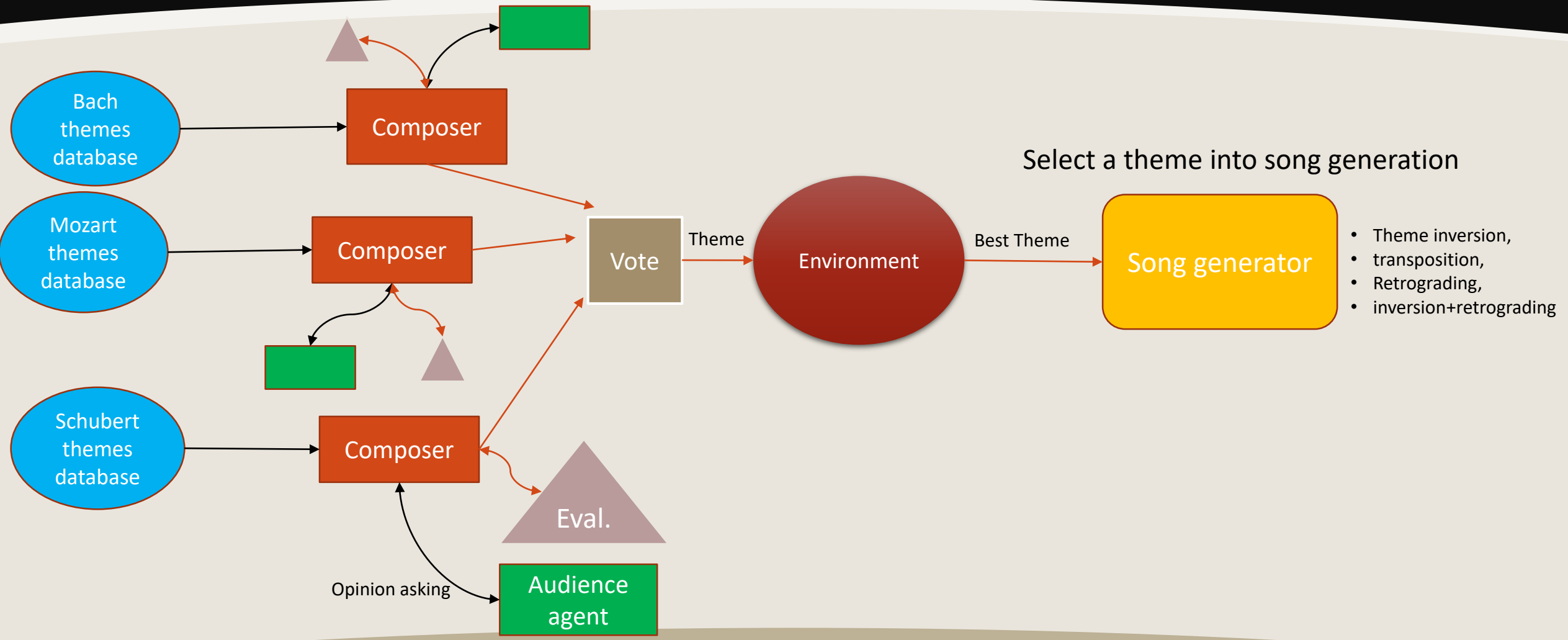
# Goal of the project

General-To-Specific-Order

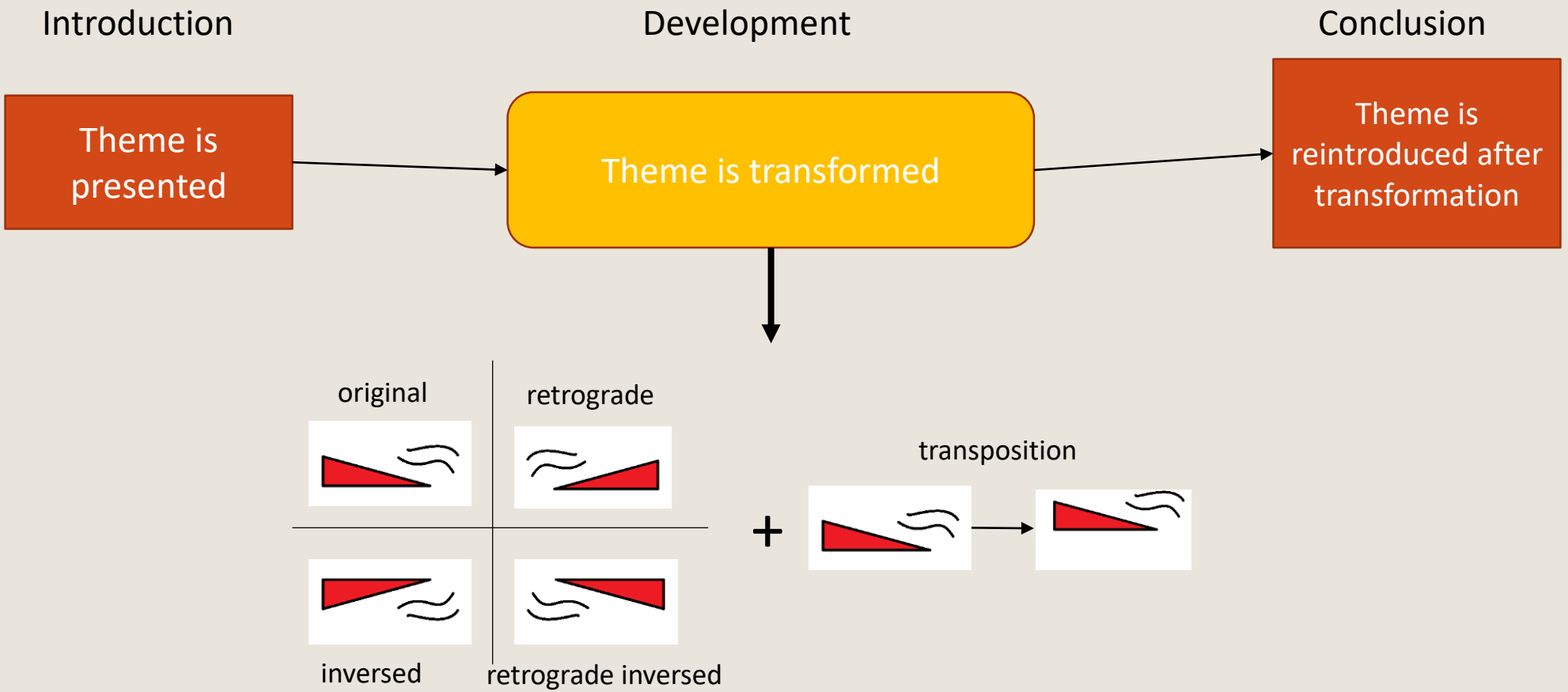
- Algorithmic composition from MIDIs

- **Multi-agent system** that generate **polyphonic songs** with structure resembling compositions devised by **human composers**.

# System Overview



# System Overview cont.



# Design Choices– Agent POV

- Why not direct interaction between Composer Agents?
  - Themes, style, harmony may be DIFFERENT
  - Leads to **Cacophony Generator**
- Instead, indirect interaction while voting
- Why Audience Agent?
  - What we wanted to do
  - What we have

# Design Choices – Artefact Evaluation

- Value of the artefact
  - **Zipf's Law**
  - Introduced in the lecture slides (thank you ☺ )
    - Monterey Mirror, Manaris et al.
- Novelty of the artefact
  - **Levenshtein** distance
  - Edit distance of the **steps between notes**
- Surprisingness of the artefact
  - Based on the pseudo-likelihood

# Design Choices – Song Generation

- Selection of the best themes in the artefact set
  - **Self similarity** measure, Murray and Ventura (2012)
  - Simple, Complex melody
- Forming the theme into a song
  - Transpose
  - Retrograde
  - Inverse

# Possible Improvements

- Make a song in every iteration now
  - NOT at the end of the program
- Possibly evaluate the whole song at each iteration
- Improve ties between both voices of the generated song

# A few comments

- Music21 is NOT the greatest library ever made
  - **Poor** documentation
- Forming the song is **HARD**
- Maybe the Markov Chain is not the best option for this system?
  - Answer Set Programming (ASP) , Boenn et al. 2010, ANTON
- We actually learned lots of things
  - All things that matter -> Learning for Good

Any questions?

# Demo