Chordination

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Real Chords. Real Time.

Chordination calculates a harmony and plays it with you in real time.
Motivation

• Make arranging more accessible – no music theory knowledge needed!
• User can focus on melody while harmonization is machine-driven
• No need to pre-record a song before generation chords
• Real-time inspiration
Chordination Block Diagram

- Voice Part
- Key
- Singing

Filtered-FFT → Chord Calculation Module → Voicing Module → Synthesis Module → Output

- Tempo Module
- History Module
- Pitch-Shift Module
- Record Module
Filtered FFT Module

Pitch From Voice

• Reduce Noise (Low-Pass Filter)
• Get Pitches (Fourier Transform)


**Tempo Module**

**Time between Chords**

- Takes user input about how regular interval indicating how often chords should change
- MVP implementation uses switches to select pre-defined values
- Extended implementation would allow users to clap in or sing in a beat indicating the tempo.
Chord Calculator

Possible Chords

● Calculates next chord based on note, key, tempo, and chord history

● Calculates matching note from pitch (Filtered FFT Module)

● Only calculates chords on chord change time (from Tempo Module)
Chord Calculator: Possible Chords

- Model chord progression as a state machine that follows traditional music theory transition rules.
- Passes chord onto Voicing Module to convert from chord into playable notes.
Voicing Module

Placing Notes in a Chord

- Finds out which exact notes to play
- Input/Output
- Organization of internal modules (validity check)
- Uses established theory
- Important considerations
  - Voice part
  - Chord priority
Synthesis Module
Integrate & Output to Speaker

- Shift
- Integrate
- Record
Evaluation Matricies

- Error
- Lag Time
- Correctness of Output Chord
Timeline

- **Week 1**: Finalize ideas & plan for module details
- **Week 2**: Start coding & implement test benches
- **Week 3**: Debugging, test the modules
- **Week 4**: Finish testing and connect modules. Implement extended functionality.
Questions?