"Music Query, Analysis, and Style Simulation"

Music 254/CS 275b

Spring 2014

Stanford University

Website

http://music254.stanford.edu

or:

http://cs275b.stanford.edu

Syllabus (see link near top of above pages):

http://wiki.ccarh.org/wiki/Music_254/CS_275b_Syllabus

Instructors:

Eleanor Selfridge-Field (esfield at stanford)
Craig Stuart Sapp (craigsapp at gmail)

Grading

Credits: 2 – 4

Grading: 25% class participation
75% project

Project deadlines:

16 April 2014: 3 page proposal (beginning of the third week)

- background on the topic you are interested in.
- survey of prior art.
- what you propose to do for the project in the next 7 weeks.

4 June 2014:

- project presentation (20-30 minutes)
- project write-up, draft version (5+ pages)

11 June 2014:

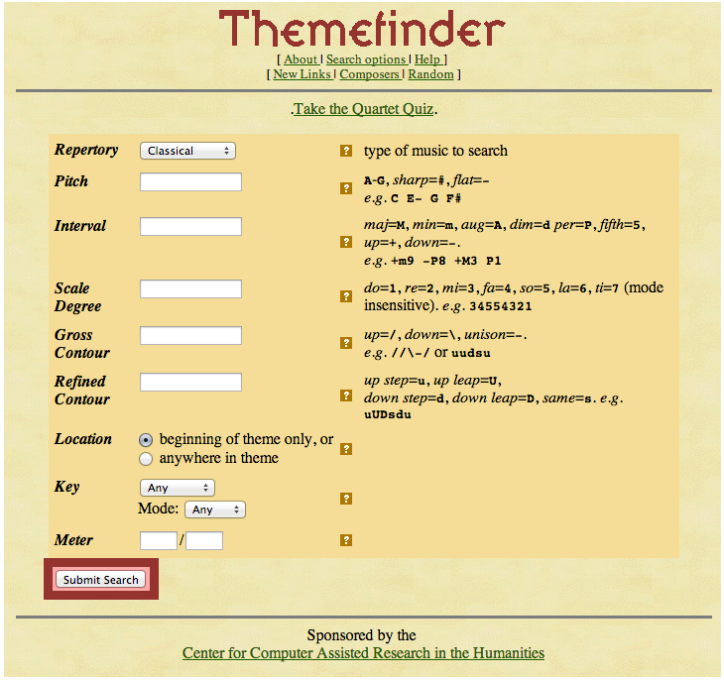
- project write-up (10 – 20 pages)

- Also, project updates and meetings throughout the quarter.

Project Ideas

- Musical Data Analysis
- Performance Analysis
- Music Generation (difficult)
- Notation (for Analytic display / performance)
- Sound Analysis (background in DSP preferred)

Music Searching



- http://www.themefinder.org
- Search for themes based on various musical features
- related paper:
  "Search Effectiveness Measures for Symbolic Music Queries in Very Large Databases".

https://ccrma.stanford.edu/~craig/papers/04/ismir2004slf.pdf

Student project turned into paper:

- Algorithm for Polyphonic Music Retrieval: The Hausdorff Metric and Geometric Hashing
  http://ca400.alangreene.net/research/ISMIR2007_p457_romming.pdf

Josquin Research Project

- http://josquin.stanford.edu
- 1200 searchable works
- Basic online analysis tools
- Data available for off-line analysis

low-level access to musical data:
https://github.com/josquin-research-project/jrp-scores

Machine Learning (CS229) Projects

Fall 2013 Quarter

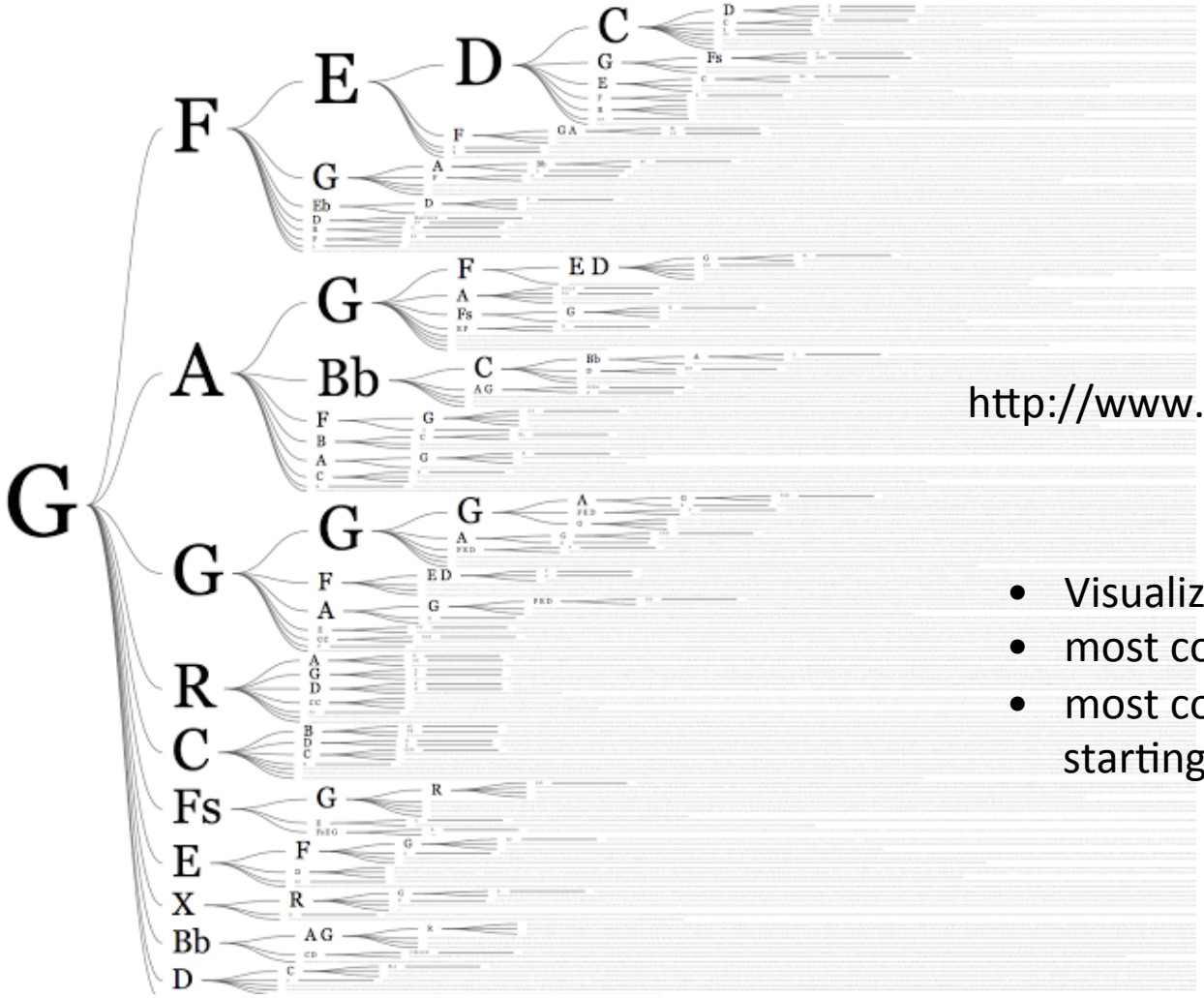
Composer Style Attribution
Jacqueline Speiser and Vishesh Gupta
http://cs229.stanford.edu/proj2013/CS229-FinalProject.pdf

Attribution of Musical Works to Josquin des Prez
Philip Lee, Kate Suckman, Zachary Sundberg
http://cs229.stanford.edu/proj2013/SunbergStuckmanLee-AttributionOfMusicalWorksToJosquinDesPrez.pdf

Application of Classification Algorithms to Renaissance Music Attribution
Alex Adamson
http://cs229.stanford.edu/proj2013/Adamson-JosquinMusicAttributionProject.pdf

Reveal Hidden Information in the Music Scores: Composer Attribution
Fang-Chieh Chou, Yi-Hong Kuo, Hsiang-Yu Yang
http://cs229.stanford.edu/proj2013/ChouKuoYang-RevealHiddenInformationInTheMusicScoresComposerAttribution.pdf

Data Visualizations



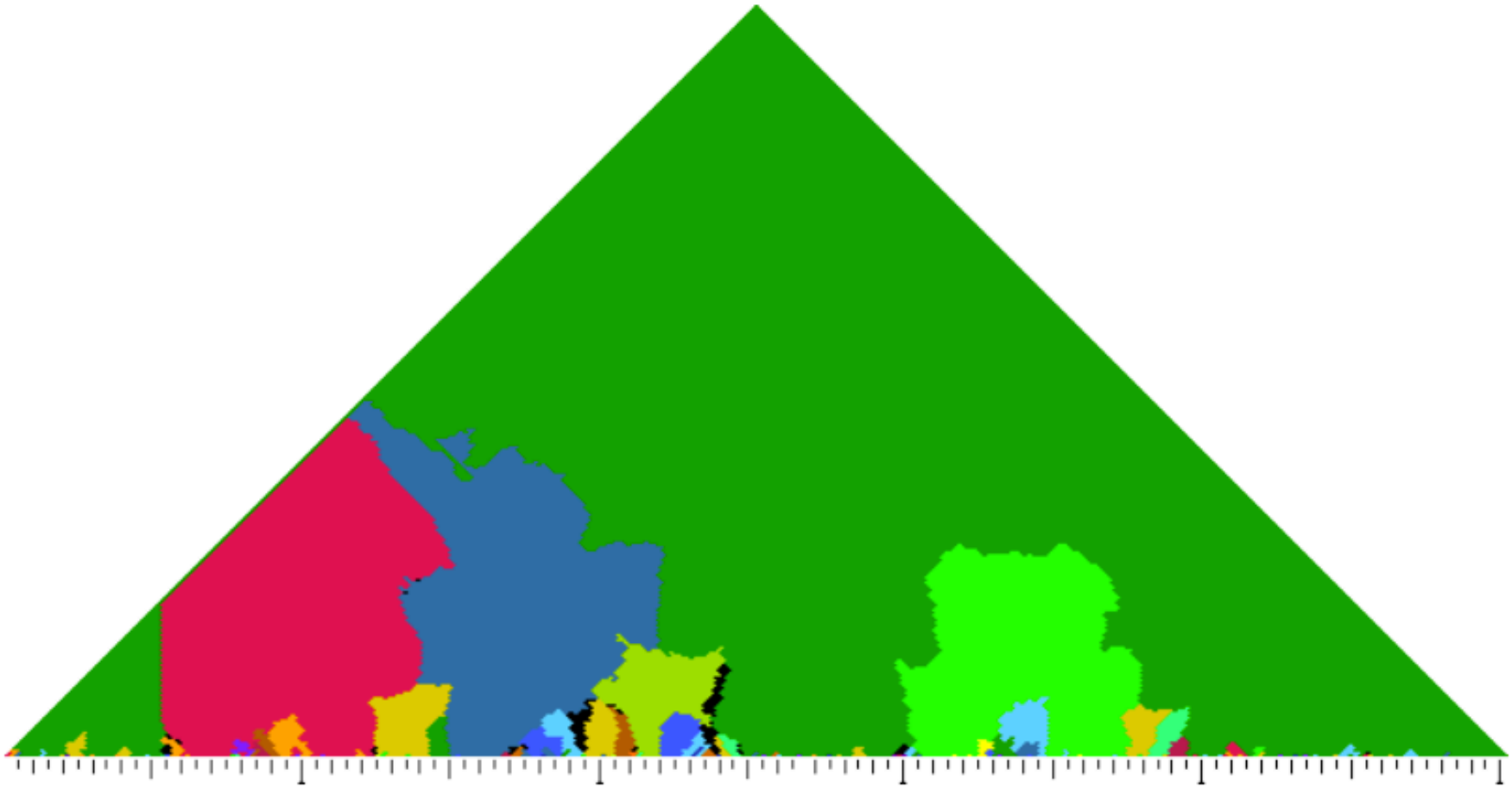
"Note Tree"

based on word trees:

http://www.jasondavies.com/wordtree

- Visualization of Markov chains.
- most common note after G is F.
- most common 5-note pattern starting on G is G-F-E-D-C.

Harmonic Visualizations

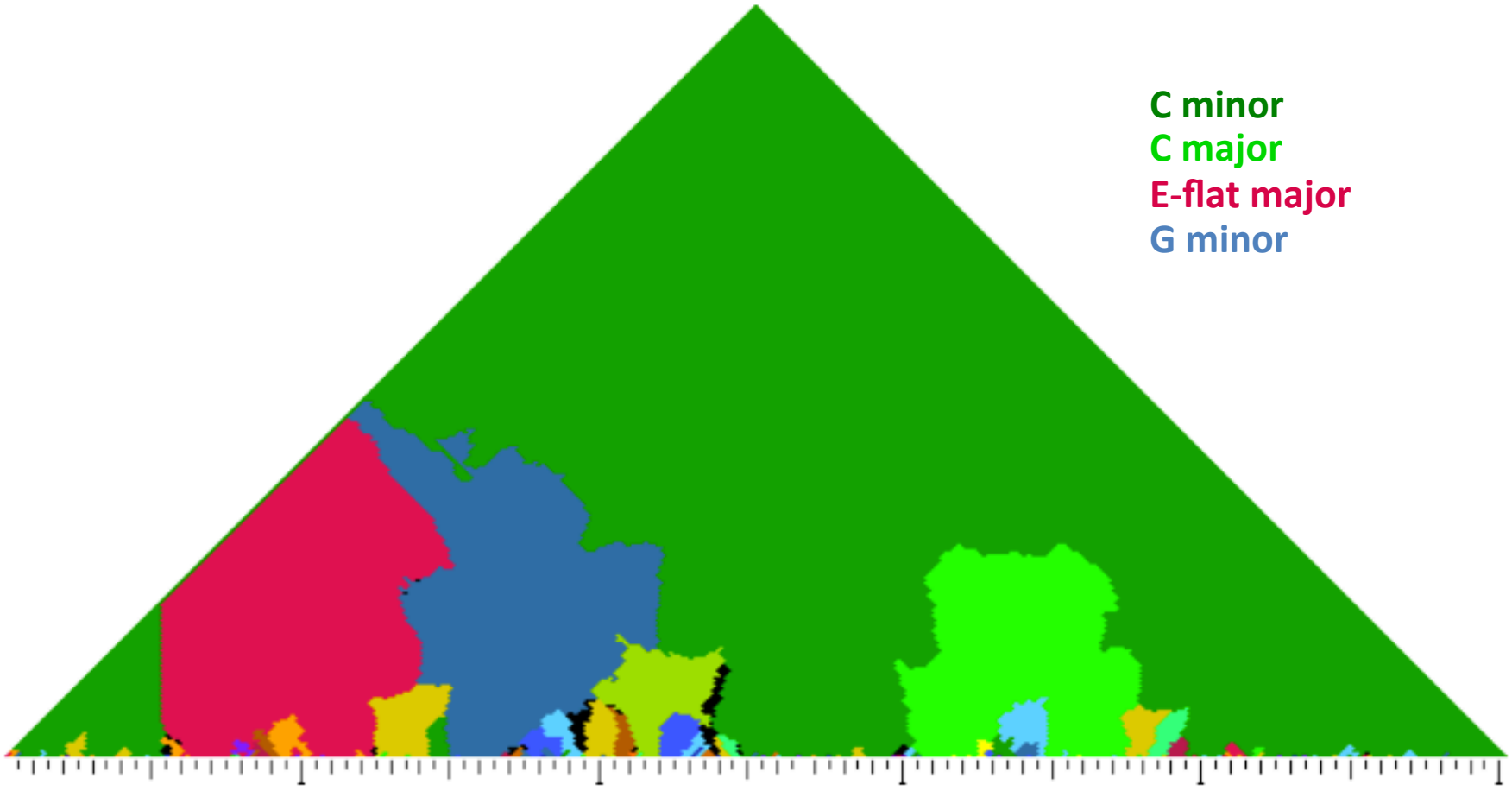


Beethoven's 5th Symphony, Movement 1: Sonata form

see: http://purl.stanford.edu/br237mp4161

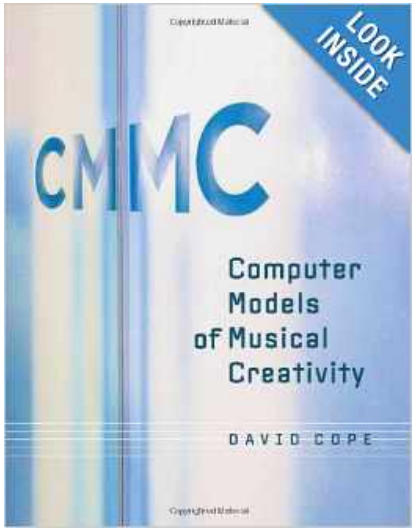
Harmonic Visualizations

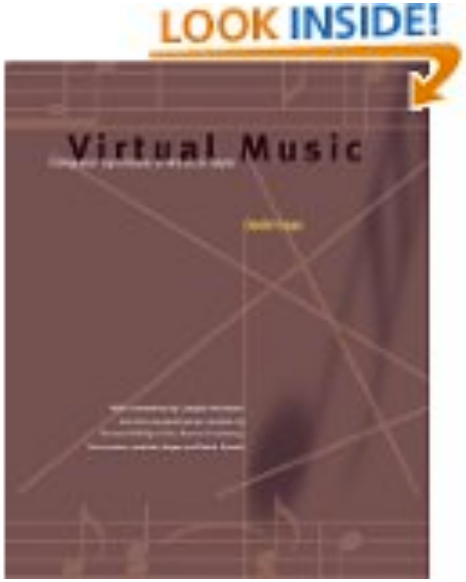
Beethoven's 5th Symphony, Movement 1: Sonata form

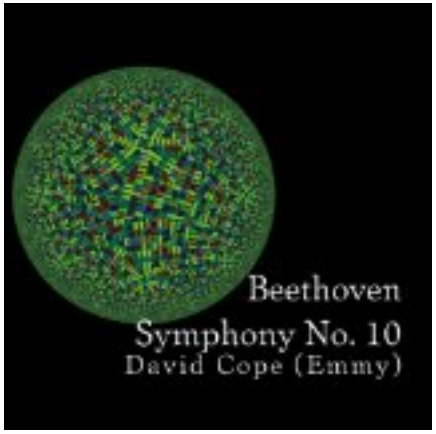


Music Generation

David Cope

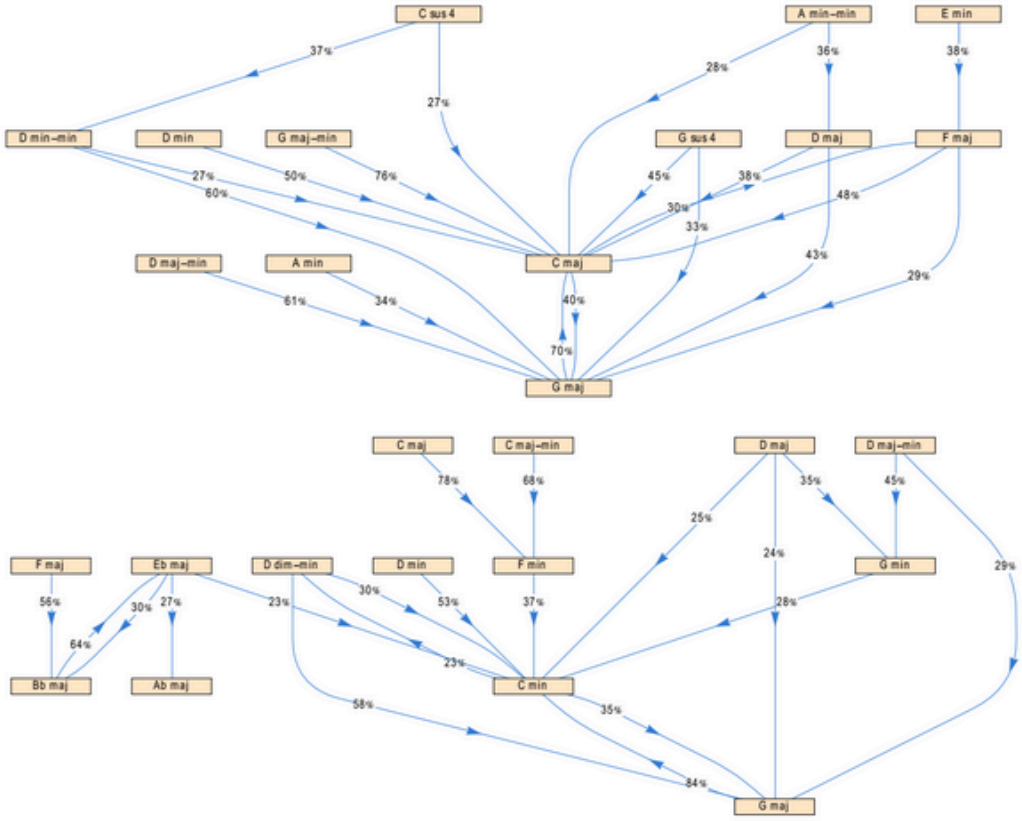






Music Generation: Harmonization

AN ALGORITHMIC APPROACH TO MELODIC HARMONIZATION
Nathaniel Eiseman



Bayesian statistical analysis of Bach chorales for automatic harmonization of melodies

Musical Data Resources

http://kern.humdrum.org

Programming Resources

- http://humdrum.ccarh.org → Humdrum Toolkit resource list

- http://extras.humdrum.org → Additional Humdrum tools
  (& C++ parse library for Humdrum files)

- http://music21.org → Python music processing with some Humdrum import.

Relevant Conferences

- ISMIR (International Society of Music Information Retrieval

  http://www.ismir.net

- ICMC (International Computer Music Conference)

  http://www.computermusic.org

- ACM (Association for Computing Machinery)

  http://www.acm.org/conferences

- MCM (Mathematics, Computing and Music Conference)

  http://www.music.mcgill.ca/mcm2013/

  - Biannual