

ELVIS (Christopher Antila)

1:

- Hi everyone. I'm Christopher, the lead programmer for the ELVIS project.
- I'm honoured to present today on behalf of the whole Montréal team.
- As with all these presentations, I have to leave out most of the interesting details, so please stop by our poster if you have questions!

2:

- The project was inspired by John Sinclair's "Corpus, Concordance, Collocation," which talks about different levels of repetition in natural language.
- The project's "founders," Julie Cumming and Peter Schubert, wondered about the most commonly repeated patterns in music.
- As experts in counterpoint, they sought an answer there. Even though scholars have been writing about counterpoint for centuries, in many ways it's the structure on which music is built, so we still have many questions about the sometimes-subconscious rules that guide its use.

3:

- In place of words, however, we have "contrapuntal modules."
- For us, the musical notation and the numbers on this slide represent the same contrapuntal module.
- The distance between the upper and lower parts is a seventh, followed by a sixth, followed by an octave. For the lower part, a "1" means the part stays on the same note, and "-2" means the part goes down by a second.
- This particular module is by far the most common in Renaissance music, where it represents a "cadence."

4:

- Throughout the project, we've been assembling an online database.
- We currently have more than 6000 pieces, with many more waiting to be uploaded.
- Our current focus is early music, written before about 1600, since we could make the biggest impact there.
- All of our data is in score-like symbolic formats, rather than audio recordings. This means the music in our target date range of approximately 1300--1900 is out of copyright.

5:

- We developed a modular, extensible Python API. Though we have so far focussed on program modules for analyzing contrapuntal modules, we designed the Framework carefully to allow a wide range of queries in the future.
- We have paid special attention to documentation, so other researchers can learn and use our Framework.
- We also paid special attention to automated testing, to ensure the trustworthiness of our results.
- We hope the Framework is the foundation for many other projects in the future.

6:

- We also developed a Web app on the Framework.
- Unlike the Framework, the Web app is designed solely for contrapuntal module analysis, trading flexibility for ease-of-use.
- Further, with a Web app, music scholars don't need to install and update software on their own computers, and they don't need to learn how to program, in order to take advantage of computer-driven

music analysis.

- You can use our Web app today by visiting <http://counterpoint.elvisproject.ca>.

6-1:

- I have four images of the Web app in action.
- Here, I'm loading a piece into the app.
- It's Josquin's "Ave maris stella" motet.

6-2:

- Here, I'm choosing which parts to compare with each other when finding modules.
- Though I've selected all combinations of two parts, we could also compare three parts at once, or only the highest and lowest parts, for example. We expect each combination to provide different results.

6-3:

- Here I've selected to display the ten most common three-interval modules in a bar graph.
- We could also view a list of results, choose a longer or short module, consider only vertical intervals, or even choose whether to display interval quality or compress compound intervals to their single-octave equivalents.

6-4:

- And here's the bar graph.
- I know you can't see the whole window, but this is just to prove it was running in my browser, and that we do have bar graphs!
- The most common modules here are actually different kinds of "parallel tenths," and the cadence module is not actually present on the graph.

7:

- Finally, I present a visualization of some of our experimental results.
- Alex Morgan combined a Venn diagram with a timeline. Time progresses clockwise, and each style period has its own coloured oval.
- Each line of numbers represents a particular module that repeated at least a certain number of times in the style period.
- You can see how each period has some unique modules, how each period shares some modules with the temporally adjacent period, and how some modules, in the centre, are common to all three periods.
- Note, however, that the first and last style periods do not have any modules in common, except those shared by all three periods.
- Also note that there are *more* modules unique to the middle period than unique to either of the others.
- This statistical view of contrapuntal style gives us a new way to talk about *musical* style in general, and with greater certainty and detail than before.

8:

- If you'd like to learn more, you can visit our website, send an email to Julie or me, or of course stop by our poster.
- Thank you!