ROBOT COMPOSERS

3,400 years ago, one of humanity's oldest artists began writing humanity’s oldest song. In 1972, Anne Kilmer, professor at the University of California, decoded an ancient hymn from clay tablets found in Syria. The oldest instrument is a flute dated back 43,000 years from Slovenia.

Music has been a part of humanity for quite some time. From ancient peoples singing praises to their gods to classical composers writing masterpieces, and the Jazz musicians of the early 20th century to modern pop, music has changed much. But underlying it all, more things are the same than different. The processes that all musicians go through when writing are largely unchanged. It is an art form, where human creativity is the key element.

But soon, all of that could change.

In a lab at the University of Malaga in Spain sits a computer. Entitled ‘Iamus’, in a matter of seconds it can compose music rivaling that which professionals would take months to devise.

The Iamus works by imitating evolution. First it creates a base song, and then creates several offspring of that song with several random changes, introduced through random changes to the base song. It throws those offspring into a harsh environment where only the best songs survive and reproduce, and repeats this process until a song that sounds like it could have been written by a human is written. After this process is complete, the computer turns the song into conventional notation and exports it as a pdf.

The music it creates is haunting, not least of all because it sounds human in spite of its digital origins. The first work, entitled ‘Hello World!’ (after a programmer tradition of making a program called hello world to learn the basics of a new language) showcases the power of the Iamus system. The piece was able to impress musicologist Peter Russell, who had not been informed of its composer, who said it was “artistic and delightful” and that he “came to like it”.

Sony is also putting their foot in the game with their own algorithms they call Flow Machines. While the Iamus learns and grows as a composer, creating music from scratch in its own unique style, Flow Machines can imitate music of any genre.

When someone wants to listen to say, an imitation of the Beatles, they can select all of their favourite Beatles songs. The algorithm then analyzes the provided songs for a number of factors, such as pitch, rhythm, and harmony. Once it has figured out the structure of the input songs, it then uses this information to create a new song that uses each of these features.

Because the Flow Machines can analyze any number of musical pieces from any number of genres, there are many useful ways to use them. For instance, if a musician wanted to see how two very different styles of music worked together, say classical piano fused with hip hop, they could provide a sample of both of these styles to the Flow Machines which would in turn provide a sample of classical hip hop.

But don’t fret just yet about musicians losing their jobs. Both the Iamus and Flow Machines are still quite dependent on the human element in order to do their jobs properly.

In the case of the Iamus, humans must define what sort of traits a song should have so that it may survive the evolutionary process and produce offspring. Musicians and scientists must work together in order to define what makes a good song, and because of this, the Iamus can be inflexible.

On the other hand, Flow Machines is completely devoid of any creativity of its own. It bases all of the music it creates off of music that has already been created. So while it can mix and match styles and genres or make music in an already established genre, it has no ability to innovate on it’s own.

Even ignoring all of that, the algorithms are still imperfect. As of yet, no top charting songs have been written by a computer. And an even greater weakness is the inability of computers to play music. While there do exist programs to play a convincing digital guitar, so far no computer has come close to imitating the complexities of a human singer's voice.

Even so, technology has a way of moving forward. All of these problems are being worked on as I speak. Perhaps the day is not so far off when the first robotic rock band sells out a concert.

HUMAN SINGING AND PLAYING MENTION SOMETHING?

TALK ABOUT DIFFERENT ROLES OF COMPUTERS IN MUSIC COMPOSITION, LIKE HOW INDEPENDENT PEEPS CAN MAKE THEIR OWN MUSIC AND HOW PROFESSIONALS DO IT AND HOW MUSIC IS MADE

MORE ON RESEARCH

CONCLUSION

Sean Russell Outline for Robot Composers

Length - Shortish, approx 2 pages

Basic structure:

Intro:

1. Start with an anecdote?
2. Hook - What would you say if your favourite song was written by a computer? That reality might be coming sooner than you think. (cliche but whatever)
3. Background, maybe some stuff about how music is created today? ie basic music theory, pop music production. Add a nod to historical stuff (like Mozart and Bach, people dig that) Also include how computers are used in modern music creation.
4. Do some relating? Everybody listens to music

Body:

1. Give some info on what computers are doing now (composing, generating sound). Overview kinda thing
2. Then go into details on research being done in each area one by one

Conclusion:

1. Bring it forward? What does this mean for the future of art and the like - try not to get too philosophical (NO ‘is creativity something only humans can do?’. None of that)
2. How does it affect people. Maybe everyone is gonna be listening to robot music in a few years

Iamus - <http://www.aaai.org/ojs/index.php/aimagazine/article/view/2464/2375>

<http://www.bbc.com/news/technology-20889644>

Melomics - algorithm(?) that Iamus and Melomics109 use