The Digital Academy, University College Cork

Digital Arts & Humanities:
Scholarly Reflections

A collection of scholarly reflections from doctoral candidates working within the digital humanities

Twenty-first Century Music Technology

Gareth Young

Gareth Young is an engineering graduate of Glyndwr University. He earned his B.Eng. in Sound and Broadcast Engineering in 2007. While studying he worked as a freelance sound engineer providing sound services to local venues across the north-east of Wales.

Gareth is also a graduate of Dundalk Institute of Technology. Here he graduated with an M.Sc. in Music Technology in 2009. After graduation he continued to research electronic devices for musical applications.

Gareth is an accredited English instructor and has taught students from all over the world. He has visited China as an English exchange student, and has also spent time in South Korea.

"Any good music must be an innovation."

- Les Baxter

As we travel through the twenty-first century, we curiously adapt the technology around us to suit our needs. As musicians in the twenty-first century are no different from you and I, they do the same.

In the twentieth century we saw a rapid spurt of technological advances in applied sciences. It was at the dawn of this era that we first saw Count Ferdinand Von Zeppelin take to the sky and in a science lab somewhere in the world, the first radio was receiving messages through the aether. Over a period of only one hundred years we now fly through the air at thousands of kilometres per hour and almost every home on the planet has an old analogue radio receiver. So how has twenty-first century technology developed over the last decade and what does that mean for composers of modern contemporary music?

As technological advances have progressed, so have the manners in which we produce sound and music. Throughout the twentieth century we leaped through rapid accelerations in science, creating new musical instruments from this technology. The birth of electronic music took place, and electronic musical instruments took form from the output of engineering science labs. Engineering experts became composers and composers became sound scientists. Another interesting change that

occurred as technology became musical was that “noise” became art and electro-acoustics became entwined with the musical genre of old. It has been convincingly argued in literature how music technology has managed to shift human mental and physical orientations, encouraging the evolution of the industrious culture we live in today.

For many, sound is taken for granted. We are constantly bombarded with “noise” from the moment we are born. Be it the steady beat of a heart monitor or the smack of a doctors hand, in our first moments of existence in this world, we are submerged in sound. Even before birth scientists believe that a developing child in the womb can recognise voices and music and that these combined can effect a child's development from within. So as sound is all around us from the start it's no wonder that we strive to control its production with the modern tools we are given as we grow. Think back to when you were a child, were you given a pseudo-musical instrument early on?

What about the toys of today? Have you seen the electronic devices that are gifted upon the younger generation? It is no wonder that today's musicians are using every means available to expose the inner workings of electronic sound generation to a public who just take these sounds as given, as something that comes from devices so simple a child can use them.

Comparing basic sound generating devices over generations highlights the technological advances of music technology in the twenty-first century. If we look at the images on our televisions, in our magazines, or on billboards, we can see that musicians are no longer wielding cumbersome guitars or holding drumsticks; they now have the power to generate music from within tiny boxes with less obvious means of sound production. This is the computer music generation and they are here to replace the old analogue electronic technology with digital sounds. Sounds which have no natural sound generating device that can be seen or held.

Digital technology can no longer be considered as a ‘new’ concept, as it's been around now for a few decades. However, with digital technology we are presented with an almost limitless world of sonic and musical possibilities, which was initially only available for the large academic institutions that could afford massive computers and synthesis devices. This digital computing may have been around for a while, but it was never more affordable than it is today. Affordability of digital devices, such as laptop computers, means that the masses now have the means of manipulating the digital realm from their home or studio. Sound synthesis is only a quick click and download away and once you have the means, the possibilities are endless. These possibilities are restricted only by the end user’s ability or imagination.

The composition of music through computers is slowly replacing the more traditional paper and pencil methods of old.

This contemporary means of composition is also finding its way into traditional musical genre. It is not unnatural for jazz musicians to have digital improvisations accompanying them on a CD or on-stage. Computer music can no longer be confined to just the electronic music taxon; it is now a tool to be wielded by all who possess a computer. Current processor speeds can quite easily handle real-time sound synthesis and the software is designed to be graphically pleasing and intuitive to operate.

In the early stages of the twenty-first century we are embracing the digital as an old friend and are incorporating it into everything we can. As computers become faster, the means through which we express our musicality has become more extravagant.

Our input device is no longer a long string of complicated coding to produce a colourful tone, but a simple hand gesture that can be recognised as a control parameter that will change anything the musician desires. You see, sensor technology is also a major influence on the computer music generation. The means by which a musician interacts with his digital creations is also mutating, controlled only by the direction of technological advancements in this field.

Not only are infra-red and motion sensors readily available from electronic stores and internet distributors, but motion tracking devices are being introduced into the home via games consoles. The Wii controller release in 2006 revolutionised home computer entertainment and it wasn't long after that this controller was reverse engineered and applied to musical applications. Recent releases include the Sony PlayStation Move controller, with the ability to track movement and location through the use of technology similar to that of the Wii and the use of a camera. Also, Microsoft have launched the Xbox 360 Kinect system, which relies only on observation of motion to control game movements. How long before these are incorporated into twenty-first century music technology? The answer is almost instantly. Examples of the use of these devices without a games console are available online to view today. Hacking this technology is not readily accepted by the distributor, but it is impossible to stop the curious minds of creative individuals.

The concepts, ideas and even the technology of the newly released to the public controllers is by no means ‘new’ either. Academic research has been carried out for decades on capturing gestures for musical manipulation, but this was limited to the elite institutes specialising in these fields and was not available for the average amateur to reconstruct and manipulate for their own means.

And yet, as time creeps forwards in this century, there are those among us who yearn and even cry out for a revival of the old technology. The clinical sound of a perfectly constructed waveform is almost painful to the ears of some fans of the

analogue world. The need for society to relive the old, for a trend to come around again and again requires the same technology to be reproduced and revisited. So we reach a peculiar point in time. One which sees us being given more freedom of expression than any other generation before us and yet we are still pining for the ‘old’ sounds that coevals of the last century were limited to.

The ‘cut and paste’ computer generation is now faced with a hunger to go out and gather their own means of sound generation and the construction of analogue devices to reproduce the ‘warmth’ in music that is somewhat missing in today's home produced music. Musicians are rummaging through the attics, storage rooms and secondhand stores trying to reclaim that which was disposed of in order to make room for the new.

So what we see today, after living through the first decade, is an amalgamation of old and new ideas being brought to the public and laid on their lap. The general populous are being given the creative freedom to manipulate old technologies, the freedom to develop new and interesting sounds digitally, and they are being offered the opportunity to do so at a fraction of what it used to cost. How lucky we are to be given such freedom, how lucky we are to live in the twenty-first century.

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