‘PROCESSING’ AND THE VISUAL ARTS

In our work with the Arduino system we came across projects which required programming which couldn’t be achieved with the Arduino programming language. A good example is in the ‘Arduino Networked Lamp’ project in Massimo Banzi’s book ‘Getting Started with Arduino’. Here, the whole point of the project was for an Arduino to obtain data from the internet – but this is something an Arduino can’t do by itself. The solution was to write a program for the PC on which the Arduino IDE was running which in one direction could connect to the internet and in the other to the Arduino itself.

What language could such a program be written in? The obvious choice was ‘Processing’. Processing is a language which pre-dates the Arduino but which has very similar aims – to enable people such as artists and designers who don’t have computer programming experience to learn how to program. Indeed, the Arduino language was based on Processing. The two languages have strong similarities with the exception that the Arduino language will only run on Arduinos (or, more precisely, microcontrollers based on the AVR architecture) while Processing will only run on Windows, Apple and Linux computers.

When we looked at Processing in more detail, it was clear that it is tied to the processes of the visual arts to an even greater extent than the Arduino. It then became clear that if both Processing and the Arduino projects are considered as a whole, together they constitute a powerful combination – Processing for the creation of visual images, the Arduino for allowing people to interact with what has been created.

The Processing project was started in 2001 by two artists/designers who had met at MIT: Casey Reas and Ben Fry. It is a simplified version of the well-established language ‘Java’ and since its original creation has had two major updates – the current version is Processing 3. To the beginner, the language consists of a visual ‘vocabulary’ of basic shapes – lines, rectangles and ellipses which can be combined by using a visual ‘syntax’. Progressing through graded exercises, visual images of surprising complexity can be produced while keeping the outcome under control. This is not easy to describe but it can be experienced quite easily at the Processing website at https://hello.processing.org/

Casey Reas

Casey Reas is an artist who works in the medium of software-based instructions that create visual processes. He has exhibited widely and has works in the collections of the Los Angeles County Museum of Art, the Victoria & Albert Museum in London and the Pompidou Centre in Paris. He studied at the University of Cincinnati and then spent the next two years developing software and electronics as an artistic exploration. In 2001, Reas earned a Master of Science degree in Media Arts and Sciences at the Aesthetics and Computation Group at the Massachusetts Institute of Technology's MIT Media Lab.

Breaking away from the idea of the computer as a mere tool, his career has been based on the notion of coding as an artistic language able to bring about new and unexpected results.

Today, Casey Reas lives in southern California where he is currently a Professor in the Department of Design Media Arts at the University of California, Los Angeles.

You can hear Casey Reas talking about Processing here: https://bit.ly/2X7uGnQ

Ben Fry

Ben Fry is the founder and principal of Fathom, a design and software consultancy in Boston, Massachusetts. He is an expert in data visualization – the art of presenting complex data in visual form to make it readily intelligible. He sees himself primarily as a designer but received his PhD in 'Computational Information Design' from the Aesthetics & Computation Group in the MIT Media Lab. His work involved combining fields such as computer science, statistics, graphic design, and data visualization as a means for understanding information.

Fry's personal work has shown at the Whitney Biennial in 2002 and the Cooper Hewitt Design Triennial at the Smithsonian Institution in 2003. Other pieces have appeared in the Museum of Modern Art in New York (2001, 2008), at Ars Electronica in Linz, Austria (2000, 2002, 2005) and in the films 'Minority Report' and 'The Hulk'. His information graphics have also illustrated articles for the journal Nature, New York Magazine, and The New York Times.

You can hear Ben Fry talking briefly about Processing here: https://bit.ly/2AlRbwb

Examples

There are many examples of the use of the Processing language to be found on the Processing website, https://processing.org Broadly, they mostly fall into two categories: (1) examples where an installation is driven by software which has been created using Processing and (2) examples where the result of the project remains in the digital world, sometimes transformed into a video file for replay.

An example of the first is to be found here: https://softlabnyc.com/portfolio/volume/ Created by SOFTlab in New York, the installation consists of one hundred slender vertical mirrors two metres high which can be rotated under software control. In the 'Volume' example, the mirrors are arranged in a 10 x 10 square and are located in a darkened room in which lighting is also under software control. There is accompanying sound and the whole responds to the presence of people who are moving around observing the installation. Although it is not made clear, the control could in principle have been achieved using Arduino microcontrollers. On the same page, the 'Iris' example, which was installed in the 'Klementium' ('Mirror Chapel') in Prague is particularly striking.

The next example, which was created by the AADRL programme at the Architectural Association in London, remains entirely in the digital world. Apparently flexible cubes combine and re-combine in increasing complexity in an environment in which the viewer is taken through a moving perspective. https://vimeo.com/177061975

In this third example, from the University of Stuttgart, both approaches have been achieved. A network of flexible glass fibre reinforced polymer (GFRP) rods are connected by robot control motors. Control of the motors results in changing shapes for the network. Separately, the behaviour of the network is predicted and presented visually in a digital display. Through a split screen presentation, the two can be seen alongside each other. https://vimeo.com/365333824

There are many other examples to be found on the processing.org website – click on 'Exhibition'. These are, we must add, the works of accomplished artists. They show our aspirations…