

In Time With Data

Gary Singh

■ **TIME-BASED MEDIA** IN the digital realm gave Morgan Barnard access to what eluded him in the analog world: the modular transformation from one milieu to another. Data could be used as a control source, whether it was MIDI data or atmospheric data.

Growing up, Barnard always harbored an interest in creativity across platforms. His father was an artist and independent filmmaker, introducing Barnard to film editing, computer graphics systems, and fine arts, all at a young age. At first, Barnard began undergraduate work at the California College of the Arts with the intention of pursuing his passion for drawing and painting, but after enrolling in a time-based media course, everything changed. In that class, Barnard discovered updated versions of what his father had already introduced him to as a kid—that is, flatbed film editing systems, Bolex 16mm cameras and Commodore Amiga computers. So he quickly changed his major to Film/Video/Performance and began exploring traditional film techniques, experimental cinema, documentary, real-time analog video, and early digital video, all of which opened him up to the modular nature of how digital media can create new ways of interactivity.

“We did a group project using computer vision systems to analyze video for producing a sound installation,” Barnard recalls. “Digital gives you the ability to transcode data from one medium to another; we were able to use the value

of any pixel to control audio output. That’s something that has always excited me about working with digital media, the ability to move data between different output and display methods.”

After several years in the film and television industry, Barnard returned to academia to get his graduate degree at NYU’s Interactive Telecommunications Program, allowing him to hone his electronics and coding chops while expanding his desire to use video as a controller for musical applications and interactive narratives—a key focus he continues to explore today.

DATA COLLABORATION

As part of his residency at Ideum, a creative installation design company in New Mexico, Barnard created Aurora Clouds (see cover and Figure 1), an LED lighting installation for Albuquerque BioPark’s Penguin Chill exhibit. The immersive exhibit takes visitors on a research expedition into the Sub-Antarctic, with Aurora Clouds hanging on display at the beginning of the exhibit to function as an entry point as visitors begin the journey.

Aurora Clouds operates by downloading live satellite data from solar winds that interact with the Earth’s atmosphere. The data then get translated into a dynamic light experience featuring 8,208 individual 5-V RGB LEDs arranged in an organic circular pattern array. In order to make the installation resemble the forecasted visibility of the Aurora in the northern and southern hemispheres, the data are downloaded every five minutes in a text-based tabular grid, which

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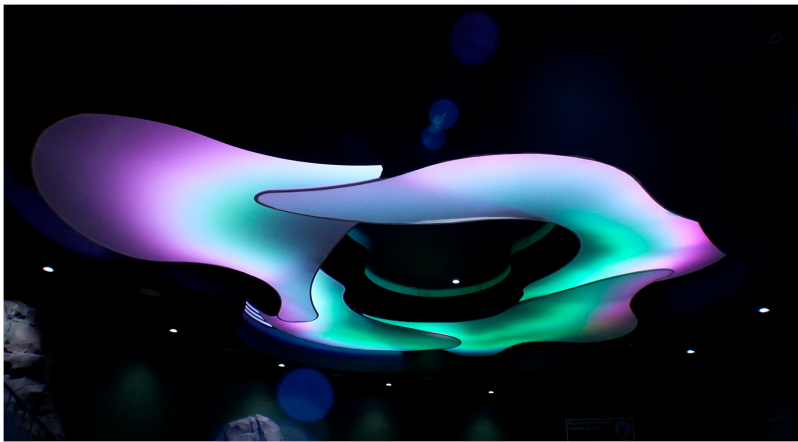


Figure 1. Aurora Clouds, courtesy of Morgan Barnard/Ideum, used by permission.



Figure 2. Big River Lines, courtesy of Morgan Barnard, used by permission.



Figure 3. Big River Lines, courtesy of Morgan Barnard, used by permission.

is then used to create a grayscale map, which then gets interpreted and colorized, the intensity of the solar energy driving the changes in color vibrancy. Barnard used MAX to download the initial dataset and create the grayscale image stream, which he then passed to VDMX for color processing. The results were then sent to TouchDesigner for additional processing and eventual mapping of the values to 48 Art-Net universes.

“Since I wanted this to be evocative of energy coming from above, I added a particle system and feedback into the system to give it a continuous motion,” Barnard says.

In a similar adventure in data translation, Barnard created Big River Lines (see Figures 2 and 3), an experimental light installation for the 2019 Currents New Media Festival in Santa Fe, using data points from a USGS monitoring station on the Rio Grande to control a real-time particle system. He used MAX to download the data and parse out two data points—discharge and gauge height—that controlled the speed of the river and the density of the particles. These variables were then passed to TouchDesigner where Barnard created the particle system and mapped the values to an Art-Net stream to drive a series of LED light strips, which were then diffused to create an animated color wash.

When it comes to time-based media, Barnard says he is trying to create experiences that translate data and work in collaboration with data about the world around us. He says the nuts and bolts of the technology are not extremely important to viewer’s understanding, but he values the moments when viewers realize they are participating in ephemeral moments in time, when they connect with something outside themselves in ways they would not have done had they just looked at graphs and charts.

"I think these types of installations can initiate conversations that otherwise couldn't happen," Barnard says. "In some ways it creates a relationship with the work where the viewer can come back to and see for themselves how things have shifted or changed over time. The work becomes something that people start to have a relationship to and can become part of the overall conversation that work generates."

BACK TO THE BEGINNING

Currently, Barnard is returning to the medium of live cinema to create ephemeral experiences from the manipulation of narrative structures, including the use of data as a narrative device. For an upcoming project, he is studying datasets about immigration—numbers from government sources—to see what kinds of stories the data can trigger.

"I plan on using the data as a timeline of events that can act as a structure for a piece that incorporates improvisation and spontaneity," he says.

Going back to his artistic roots in painting and drawing, Barnard is also currently experimenting with plotters to draw datavisualizations, creating works that combine and contrast the repeatability of digital techniques with the fluid and expressive forms of the analog world.

"I see the advances in display technology such as LED micro tiles, projection, augmented reality, and VR systems to be really fertile areas to explore," Barnard says. "I am really interested in using VR for previsualization and starting to experiment with bringing real-world data into virtual environments."

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