

## Opte as an Aesthetic Experience

This paper outlines why the images available at <http://www.opte.org/> are works of art, and it reviews the philosophical foundations of the images, touching tangentially on the technology behind the images. This paper could be expanded on, but the skeletal ideals and arguments are conveyed here.

## Introduction

When I began the Opte Project in the fall of 2003, I was an undergrad student working as a consultant for a small network security company. While having lunch with my colleagues, we discussed the Internet Mapping Project of William Cheswick<sup>1</sup> and Hal Burch<sup>2</sup>. Their mapping project collects data from the Internet and visualizes it into maps that look somewhat like a pile of feathers. The maps they created became known as a “peacock map”. Although I was impressed by these images (I have their poster hanging in my house), I was not convinced that their project was serving the greatest good. Cheswick and Burch produce images, but the images alone do not seem to be very useful, nor do they release the code for their project to allow the images to be functional for the rest of the world. I am a very big proponent of free software, and having something that people could use to image their networks seemed to be a useful endeavor. During lunch, I commented that, “I can write a program that can map the entire net in a single day.” That comment was challenged by my colleagues, and I met the challenge with a fifty-dollar bet. Thus my project was born; although I had no idea what I was getting myself into.

The goal of the project was to use a single computer and single Internet connection to discover and map the routing relationship of every single /24 network (also known as a Class-C

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<sup>1</sup> William Cheswick works for a company called Lumeta, they create images of networks, yet nothing half as complex as the Opte images.

<sup>2</sup> Hal Burch also is part owner of the Lumeta corporation.

network) on the Internet. The math to this project is rather complex and not useful to the purpose of this paper, so it will be omitted. The most basic description of my project was to figure out where and how every single routing device on the Internet connects, and to do this in a single day. After collecting that data, it was to be converted into a 3D abstract using LGL that visualizes the Internet, allowing research and greater understanding of the 2D world of the Internet.

After completing proof of the concept, I continued to program, finishing the first abstracts in late October 2003. I thought it would be best if I placed the images on a web site, so I thought up a name and created a presence for the project on the Internet. I dubbed the project “Opte”, and it can be found at: [www.opte.org](http://www.opte.org). Soon after the release of the images, word of the Opte Project began to spread, and a number of news groups started to publicize my project. At first it was placed on Slashdot, then other Internet news sites picked it up. Articles on the project were published in *New Scientist Magazine*, the national Brazilian newspaper *JB*, the *Discovery Channel Canada*, and a dozen or so European newspapers and magazines. I was also interviewed for Readers Digest and a number of news radio programs, books, and magazines. The web site gets nearly a million page views a day when a new image is released, so it would be fair to say that the images really do talk to many people, and they talk at many different levels. This paper will explore the aesthetic values of the project.

## Opte as an Aesthetic Experience

The Opte images themselves have many uses, including modeling the Internet, analyzing wasted IP space and IP space distribution, detecting the result of natural disasters, weather and war, security, monitoring, and, most importantly to this paper – Opte is Art! There is a special aesthetic to the images that speak deeply to people. When I first opened the first Image on my computer, I did not know what to expect, maybe a scrambled mess of lines, maybe a big blotch, or maybe the image would not even open. But the software worked, and I was greeted with an image that compelled me to stare deeply into my monitor, absorbing the electrons as if they were rays of sunlight.

I fell in love with the aesthetics of the project: all of the Internet technology represented in a single image; how each line, each intersecting point, is actually a physical place in this world as-well-as a virtual one; and that each little location was created by a human, and some person sits at their desk and works at that little red, blue, yellow or green intersection. The value and shock of this realization compelled me to write this paper to discover how other philosophers would feel about the project and images.

Philosophers, such as R. G. Collingwood, Susanne Langer, and Edward Bullough, would certainly have something to say about the output of Opte. Collingwood, author of *Principles of Art*<sup>3</sup>, sees art in the distinction between the means and end of the project. Langer, whose thoughts were spoken in *Feeling and Form*<sup>4</sup>, would have categorized the Opte image as art, bearing “a close logical similarity to the forms of human feeling.” Bullough said that a level of distance would be required to properly understand the message conveyed by such a complex abstract, as articulated in *‘Psychical Distance’ as a Factor in Art and as an Aesthetic Principle*<sup>5</sup>.

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<sup>3</sup> R. G. Collingwood, *The Principles of Art* (London: Oxford University Press, 1938)

<sup>4</sup> Susanne K. Langer, *Feeling and Form: A Theory of Art* (New York: Scribner, 1953)

<sup>5</sup> Edward Bullough, “*Psychical Distance’ as a Factor in Art and as an Aesthetic Principle*,” *British Journal of Psychology* (1912)

Collingwood categorized Opte as art and not simply a craft, nor a means to an end. Collingwood stated that “craft always involves a distinction between means and ends.” There is a large separation between the science and algorithms of the Opte project and its abstract nature, with colors and sphere layout that arose from personal choice. Collingwood also distinguished between craft and a finished product. For example, if you create a frying pan, you are producing a product for the end purpose of cooking, and, according to Collingwood, the frying pan would be a finished product and not an art. The Opte project is an abstract principle and may not be a finished product. The Opte project, by nature, is an on-going means that may never actually come to full fruition as a product. The information the project is visualizing is nearly a living organism. The Internet is not a single thing; it is the means to communicate, to create, to design, to think, and, yes, to visualize; so, like Opte, it may also not be a complete product, just a continually changing, and evolving project. Collingwood specifically says, “Art as such does not imply the distinction between planning and execution.” Under Collingswood’s principles, not only is Opte art, the entire Internet is art.

If Collingwood would confirm Opte as art, then what would another Philosopher such as Susanne Langer say? She is deeply nestled into the idea that music follows the forms of human feeling. She further expands on her argument to state that all art follows suit, and art is the form of human feeling. She goes further into the depth of emotion bound to a form and art following such form, stating:

...music is “significant form.” And its significance is that of a symbol, a highly articulated sensuous object, which by virtue of its dynamic structure can express the forms of vital experience which language is peculiarly unfit to convey. Feeling, life, motion and emotion constitute its import.

The Opte images are symbolism and abstract at the highest form; they are computer-generated images of a single dimensional world that exists in billions of parts and places. When looking at the image, the feeling of life, motion, and

emotion and the pure grandeur of the Internet are conveyed. Langer continues and says,

...the true power of the image lies in the fact that it is an abstraction, a symbol, the bearer of an idea.

If Langer is right, then Opte is a perfect example of art, an abstract of pure energy, conveying the Internet as a free form imitating life, and the image is presenting energy as it imitates life.

Another method to view Opte as an aesthetic experience is by way of distance. Edward Bullough wrote:

It is a difference of outlook, due—if such a metaphor is permissible—to the insertion of Distance. This Distance appears to lie between our own self and its affections, using the latter term in its broadcast sense as anything which affects our being, bodily or spirituality, e.g. as sensation, perception, emotional state or idea.

When you take a step back and allow your mind to not wrap around the technical details of the images produced by Opte, the pure spirituality of the image becomes more apparent. The emotional state is not generated by the computer, but by the massive and complicated nature of the image itself whose colors and geometric designs flow together to create one completely connected universal ball. Each vertex slightly separated from, yet connected with the next. In Bullough's words, there is a "difference of outlook", when one separates the image from what it represents.

Maybe there is more value in the image when one does not separate the symbolism; perhaps over distancing oneself is a bad way to view the image. The image may be best served when conceived as the magnitude of effort creating such a place, this electron universe we call the Internet. You can look into the stars of the image and see galaxies, you can see nebulas, and each one little part is a computer, one little place on this huge, gigantic, overloaded world.

Yet, you and I are in there someplace, our contribution to the electron world, our virtual space – in the image we are all one man, one machine.