For most, the act of seeing is an unremarkable event — few people give much thought to the mechanics behind this commonplace activity. But, for New York-based artist Devorah Sperber, how the brain interprets visual information forms the centerpiece of a fascinating artistic practice.

Interpretations: Devorah Sperber features sculptures by Sperber that not only explore how the brain interprets visual information but also finds surprising bridges between classic painting techniques and modern digital technology.

At first glance Sperber's sculptures appear to be multi-colored abstractions composed from volumes of craft materials like spools of thread, chenille stems, map tacks, gem stones, or marker caps. For instance, Sperber's homage to Leonardo da Vinci's Last Supper comprises 20,736 spools of thread which create a life-sized mural that is almost 30 feet wide.

When viewed through special optical devices like a clear acrylic sphere or a convex mirror, however, recognizable images from art history surprisingly emerge.

Sperber meticulously crafts her works so the viewing process mimics the way the eyes and brain interpret visual stimuli. Many of her abstracted images are constructed upside-down and backwards, which is the way the eyes absorb information.

The optical device functions as a brain, condensing, inverting, and reversing raw color and value into something identifiable.

Upside-down and backward composition alludes not only to the biological mechanics of sight, but also to the mechanics of the camera obscura, a projector-like device some art historians believe many Old Masters may have used.

The construction method most apparent in Sperber's work — using individual bricks of color to assemble a larger image — is her nod to modern technology. A computer program breaks her chosen image into pixels, the building block of digital imaging technology. She translates the pixels into sculpture — her spools of thread, chenille stems or gem stones function as three-dimensional pixels. Her mirrors and lenses operate not only as human eyes and brains but as computers, 'zooming out' and pulling the colors together, refocusing the picture.
My current body of work consists of sculptures assembled from thousands of ordinary objects — spools of thread, marker-pen caps, "flower power" stickers, map tacks, chenille stems (a.k.a. pipe cleaners), and Swarovski crystals. The imagery is derived from digital photographs and renderings, which I manipulate and translate into "low-tech" pixels.

While many contemporary artists utilize digital technology to create high-tech works, I strive to "dumb-down" technology by utilizing mundane materials and low-tech, labor-intensive assembly processes. I place equal emphasis on the whole recognizable image and how the individual parts function as abstract elements, selecting materials based on aesthetic and functional characteristics as well as their capacity for an interesting and often contrasting relationship with the subject matter.

My thread-spool works are often installed so that viewers first perceive the spools of thread as a random arrangement of colorful cylinders. It is only after they view the thread-spoons through an optical device that the recognizable image emerges.

Most of my thread-spool installations incorporate clear acrylic spheres as optical devices. The viewing spheres shrink and condense the thread spool "pixels" into recognizable images while also rotating the imagery 180 degrees like the human eye. This shift in perception functions as a dramatic mechanism to present the idea that there is no one truth or reality, emphasizing subjective reality vs. an absolute truth.

My interest in the biology of vision grew from my desire to understand how viewers experience my work. My thread-spool installations illustrate specific visual experiences related to the biology of vision such as how the human eyes and brain process sensory data:

Photos bouncing off the spools of thread reach our eyes where they are turned into a pattern that is sent to the primary visual cortex where the rough shapes are recognized. The pattern is then sent to higher regions where colors are recognized and where thread-spool identities are encoded along with other data. Bundles of nerve cells carry information. Traffic flowing from top to bottom is called feedback or top-down processing. There are 10 times as many nerve fibers carrying information down as there are carrying it up. So what we see is based on what neuroscientists call "top down processing." And what we see depends on the framework built by past experience that interprets raw data. In other words, the brain is assembling or projecting what it knows about an object into a recognizable image.

When the top (or brain) is concussed it knows what it is seeing (in this case, initially focusing on what appears to be a random arrangement of thread spoons), the bottom level of data is overruled. This may explain why my use of thread spoons creates such a jolt when the viewer sees the recognizable imagery in the viewing sphere, as the brain abruptly shifts focus from the individual spoons to the whole recognizable image.

Overall, my current body of work exemplifies my interest in the links between art, science, and technology through the ages, visual perception, repetitive processes, truth of materials, the feminist art preposition of bringing genres into "high art," and the scientific systems theory which focuses on the whole as well as its part to gain understanding.

— Devorah Sperber, 2008