Warped Perspective

a mathematical and aesthetic journey with the fisheye
In 1906, optical physicist Robert W. Wood (right) wanted to invent a lens that would show the world from the perspective of a fish, “whose view from underwater compresses the entire horizon” (Vox). His paper discussed an experiment involving “a camera in a water-filled pail starting with a photographic plate at the bottom, a short focus lens with a pinhole diaphragm located approximately halfway up the pail, and a sheet of glass at the rim to suppress ripples in the water” (Vox). The resulting fisheye lens might have remained a novel item of early photography consigned to oblivion, but instead it took on a life of its own as fisheye lenses became commercially available in the 1960s. The fisheye’s multipurpose style has proven successful and popular from the lens’s first prototypes to modern smartphone apps.
The mathematical processes that create the fisheye mainly involve manipulation of angles, distortion, and perspective. Rectilineal lenses represent straight features as straight lines. Distortions, therefore, are deviations from rectilineal projection (Wikipedia). Fisheye lenses are extremely wide, massively distorting their subject matter and creating an illusion of convexity or concavity. The result is either hemispherical, meaning all the points in the image appear to be of equal distance from the center; or panoramic, conveying a massive scale using wide angles (Wikipedia). “While wide-angle rectilinear lenses can capture angles of view approaching 100 degrees, fisheye lenses can stretch that to 180 degrees — impossible to do without the light bending science they employ. The tradeoff is distinct: Straight lines anywhere but dead center in the fisheye image appear to curve. The farther they are from center, the greater the curved distortion” (Cunningham).

Left: diagram from Wood’s original experiment
Armed with this knowledge, I sought to take photographs to demonstrate each of the most culturally prevalent and/or practical uses of the fisheye lens.
Honoring the lens’s mathematical origins, I naturally chose fibonacci spirals as my first subject. The objects appear tightly contained and bounded, exacerbating their circular patterns.
Fisheye has the ability to make people look larger-than-life. This combined with its trippy quality made it popular among the psychedelic artists of the 60s and 70s such as the Birds and Jimi Hendrix. I tried capturing this vibe with my outfit and the setting.
Skate photography typically uses a fisheye lens to compress the shape and expanse of a skate park. I only had access to a longboard via my friend Macie, so we turned it out album cover-style, reminiscent of 90s music videos.
I took this picture in my bathtub to capture the monotony of being trapped in quarantine. Astronauts often use fisheye lenses to film their vessels because the fisheye is uniquely capable of capturing tight spaces...
...as well as massive spaces.
Fisheye distortions provide interesting opportunities to examine scale. Here, the tops of the trees converge into a center point rather than reaching infinitely toward the sky.
Of course, humor is one of the fisheye’s primary strengths. Perhaps this is the last thing a fish sees before being eaten up by a hungry shih tzu-poodle mix, harkening back to Wood’s first experiment; or perhaps it more accurately captures the chaotic energy of how I am woken up every morning than a regular lens would.
Image sources

In order of appearance:


Image sources (cont’d)


https://www.nasa.gov/content/fisheye-view-of-astronauts-in-tranquility-node
Works cited

