The image. When viewing a bistable illusion—the simultaneous representation of two figures in one image—one can see both figures, but can one see them simultaneously?

Dutch artist Maurits Cornelis Escher (1898-1971) created a world of imaginary spatial constructions, a world that could exist only on paper. His lithograph Relativity (1953), on this issue’s cover, depicts three worlds inhabited by 16 figures and linked by a mindbending series of stairwells moving simultaneously in separate directions. Its quasi-symmetry, abstracted, develops to join a greater symmetry. One world points up, one left, and one right. Which world contains the viewer?

Computer science consists of at least three worlds—hardware, software, and firmware. The world of firmware, developed to reduce the semantic gap between hardware and software, has multiple levels and intricacies: symmetries and quasi-symmetries.

Are Escher’s perspectives resolvable? Can we bridge the gaps between his three worlds, or see them simultaneously? Has firmware resolved the hardware/software gap, or bridged its companion worlds?

The artist. The youngest son of a hydraulic engineer, Escher initially studied architecture at his father’s urging. The young man’s obvious bent for decorative art, however, coupled with his equally obvious inadequacy in other studies led him to substitute art for architecture.

Although Escher’s development covered four periods, his work falls into two broad groups, pre-1937 and post-1937. The two groups reflect entirely different visions. The eight Escher lithographs illustrating this issue of IEEE Software were created between 1945 and 1961.

While Escher remained in southern Europe, Rome for the most part, his work depicted natural settings—landscapes and external images. In 1935, fleeing politics in general and fascism in particular, Escher and his family moved north. After 1937 (having lived in Switzerland, Belgium, and finally Holland), his vision turned to internal images—images not found outside his own mind.

Escher’s four periods were Landscape (1922-37), Metamorphoses (1937-45), Perspectives (1946-56), and Approaches to Infinity (1956-70). Our cover image represents Escher’s Perspectives period. The placement of conflicting figures in close conjunction (at the top center of the lithograph, for example) graphically depicts contravening realities—realities utterly unaware each of the other. For Escher’s featureless figures have no eyes to see, no ears to hear, no mouths to speak nor breathe through.

—Henry Ayying
Assistant Editor