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Star-Shaped Set Inversion Map Fractals

Inversion of points in the plane with respect to a circle has been of interest to geometers, including those working in fractals. Indeed, in *The Fractal Geometry of Nature*, Mandelbrot discusses successive inversion with respect to a family of circles. Some relatively recent work illustrates the fractal attractors generated by systems of circle and/or star-shaped set inversion maps. It appears that the handful of papers in the literature focus on the graphical beauty of the sets, without any careful discussion of the underlying mathematical machinery. In this talk, we establish that such systems can be cast in terms of contractive maps on an appropriate complete metric space. We show some examples and, for fun, demonstrate that the LIFSM framework for signals can readily be adapted to use such maps. (This talk is based on the MSc work of B. Boreland.)