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Finding Gold in the Forest: Fractal Trees and The Golden Ratio

This talk will expand on the talk presented by Dorette Pronk of Dalhousie University (in the same session). We continue with a discussion of the classifications of symmetric binary fractal trees via an analysis of the closed ϵ -neighbourhoods using methods of computational topology. We illustrate the theory we have developed to study fractal trees by discussing an overview of the topology of four self-contacting trees that are related to the golden ratio. These four trees each possess remarkable symmetry, and their topological barcodes demonstrate the rich structure that a topological barcode can add to a fractal tree.