

Harsha Gopalakrishnan



Department : Mathematics & Statistics

Guide : Dr Srijanani Anurag Prasad

Academic background

I completed B.Sc Mathematics from Kannur University in 2017 and M.Sc Mathematics from Calicut University in 2019. I qualified CSIR-NET in 2019 and GATE in 2020 and 2021. As I am passionate about Mathematics, I joined IIT Tirupati in August 2020 as a research scholar.

Research Interests/Broad area

I am interested in fractals and currently concentrating on labyrinth fractals on various geometric figures in a plane. Labyrinth fractals on squares and triangles have been widely studied for more than a decade, and they have multiple applications in real life, especially in Physics.

Advisor Information

Dr Srijanani Anurag Prasad is an assistant professor at the Indian Institute of Technology Tirupati. Her research interests are Fractals, Fractal Interpolation, Wavelets and Approximation. She completed her PhD in Mathematics from the Indian Institute of Technology Kanpur in 2012. After completing her PhD, she joined Indian Statistical Institute Delhi Centre as NBHM post-doctoral fellow. Before joining IIT Tirupati, she was a visiting faculty in the Department of Mathematics, Indian Institute of Science Education and Research Bhopal from July 2014 to December 2015 and an Assistant professor in the Department of Applied Science, The Northcap University from January 2016 to July 2017. She has 13 published papers in reputed journals.

Thesis Objectives

- I completed the construction of quadrilateral labyrinth fractals in a plane and studied some of their topological properties. Now, I am concentrating on the various fractal dimension of the constructed fractal. I also plan to examine the construction and properties of labyrinth fractals in different geometric figures.

- I plan to extend the constructed fractals in various directions, such as mixed and super mixed cases. This fractal construction uses more than one labyrinth pattern and studies its properties and dimension.
- I want to investigate the labyrinth fractals associated with various converging sequences and study their behaviour.
- I plan to examine the application of these constructed fractals, especially when the similarity property is lost.

Teaching Assistantship

MA2021: Linear Algebra

Future plans

Extensive research is going on in the area of labyrinth fractals. I like to continue my research in various properties of already constructed labyrinth fractals and plan to construct and study these kinds of fractals even after my research. Since it has a wide application, I need to find the possible application of various labyrinth fractals.

Papers in preparation

- A paper on the construction and topological properties of quadrilateral labyrinth fractal was submitted for publication.
- A paper that examines the various fractal dimension is under preparation.