

# Coupled fixed point theorem and fractals on mixed patterns

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## Abstract

**Keywords:** coupled fixed point; fractal; mixed pattern;

**Domain:** mathematics

**Section:** Elaboration of the doctoral thesis

The main aim of this talk is to underline a coupled fixed point theorem on sets constructed by finite sequence patterns.

We generate mixed patterns using a graph-directed fractal operator such that each finite sequence of patterns constructs a set of mixed patterns. A distance based the areas of the black squares constructs a complete metric space on the mixed patterns' set.

As an initial result from (Simon, 2020), we get that the fractal operator has an unique fixed point of the set generated by the mixed pattern.

This talk underlines a coupled fixed theorem interpreted on a set constructed by finite sequence patterns. The coupled fixed theorem is also connected with the Vicsek fractal.

## References

Adrian Petruşel – Anna Soós, Coupled fractals in complete metric spaces, *Nonlinear Anal. Modelling and Control*, 23(2018), No. 2, 141-158.

Levente Simon, Fixed point theorem and self-similarity on mixed Vicsek patterns, *Miskolc Mathematical Notes*, accepted.