PhD research topic proposal

BME, Doctoral School of Mathematics and Computer Science

Name of supervisor :

Károly Simon

Degree:

DSc

Title of the topic:

Self-similar and self-conformal fractals

Short description:

In 1970's Mandelbrot pointed out that fractals appear everywhere. In biology, geology, physic, finance etc.. We study the geometry of fractal sets. In particular, we focus on attractors of certain dynamical systems which are called self-similar or self-conformal iterated function systems. To study this kind of fractals, one needs to have knowledge of ergodic theory and dynamical systems and also of geometric measure theory. In our department, there is a very strong group working on dynamical systems. So, the prospective Ph.D. student will be able to obtain the required knowledge from dynamical systems on our numerous dynamical systems courses on the go.
We study this self-similar sets from the point of their Hausdorff or other fractal dimensions. In recent years there has been a very significant achievement on this field but the most important problem of the field still remain open. The task of the Ph.D. student is first to get a deep understanding of the existing results of the field and then make significant progress in this field. The prospective student will be part of our very strong Dynamical Systems research group.

Requirements:

Basic knowledge of measure theory.

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Place of work:

Department of Stochastics, Institute of Mathematics, BME

Statement: *The conditions of the research above are satisfied, the theme is confirmed by the Head of the Department/Institute*