

PhD research topic proposal
BME, Doctoral School of Mathematics and Computer Science

Name and degree of supervisor :

JÁNOS PACH, Doctor of Mathematical Sciences (Hung. Acad. Sci.)

Are you willing to supervise Stipendium Hungaricum applicants?

Yes

Title of the topic:

Geometric and Topological Graphs

Short description:

A geometric graph is a graph drawn in the plane such that its vertices are points in general position and its edges are straight-line segments between these points. Topological graphs are defined in the same way, except that now curvilinear edges are permitted. There are many interesting results and open problems on geometric and topological graphs that are relevant to well known questions in discrete and computational geometry, graph drawing, and additive combinatorics, such as the halving line problem (Erdős–Lovász–Simmons–Straus), questions on repeated distances and incidences (Erdős, Szemerédi–Trotter), etc. To settle these problems, we need to further develop the structural and extremal theory of intersection patterns of geometric objects.

Requirements:

Knowledge of graph theory, advanced combinatorics, probabilistic and algebraic methods.

Contact:

E-mail:

pach@renyi.hu

Place of work:

ELKH Rényi Institute