Large Networks Seminar

László Lovász – Miklós Abért – Balázs Szegedy – Dezső Miklós – Zoltán Király

Friday, 12:15 pm, D. 0-823, Kitaibel Pál hall

ELTE Déli tömb, Pázmány Péter sétány 1/C

This is a kickoff seminar for the DYNASET Synergy Program supported by the European Research Council, led by László Lovász, Albert-László Barabási and Jaroslav Nesetril. The main aim is to create a synergy between graph theory and network science. The planned activities range from theoretical mathematics, including dynamical systems and graph limits, to real life applications, like brain research.

Kinetics of social contagion

János Kertész

May 17, 12:15 pm

Diffusion of information, behavioral patterns or innovations follows diverse pathways depending on a number of conditions, including the structure of the underlying social network, the sensitivity of individuals to peer pressure and the influence of media. We introduce a general model (the generalization of the Watts threshold model) that incorporates threshold mechanism capturing sensitivity to peer pressure, the effect of 'immune' nodes who never adopt, as well as a perpetual flow of external information and study it by analytical methods and simulations. While any constant, non-zero rate of dynamically-introduced spontaneous adopters leads to global spreading, the kinetics by which the asymptotic state is approached shows rich behavior. In particular we find that, as a function of the immune node density, there is a transition from fast to slow spreading and the kinetics in these regimes are governed by entirely different mechanisms. This transition happens below the percolation threshold of network fragmentation, and has its origin in the competition between cascading behavior induced by adopters and blocking due to immune nodes. This change is accompanied by a percolation transition of the induced clusters. We calibrate and validate the model using Big Data. In collaboration with Zhongyuan Ruan, Gerardo Iniguez and Márton Karsai.