1135-05-988 **Jacob Fox**, **Janos Pach** and **Andrew Suk*** (asuk@ucsd.edu). *Approximating the rectilinear crossing number.*

A *straight-line* drawing of a graph G is a mapping which assigns to each vertex a point in the plane and to each edge a straight-line segment connecting the corresponding two points. The *rectilinear crossing number* of a graph G, $\overline{\mathrm{cr}}(G)$, is the minimum number of pairs of crossing edges in any straight-line drawing of G. Determining or estimating $\overline{\mathrm{cr}}(G)$ appears to be a difficult problem, and deciding if $\overline{\mathrm{cr}}(G) \leq k$ is known to be NP-hard. In fact, the asymptotic behavior of $\overline{\mathrm{cr}}(K_n)$ is still unknown.

In this talk, we present a deterministic $n^{2+o(1)}$-time algorithm that finds a straight-line drawing of any n-vertex graph G with $\overline{\mathrm{cr}}(G) + o(n^4)$ pairs of crossing edges. Together with the well-known Crossing Lemma due to Ajtai et al. and Leighton, this result implies that for any dense n-vertex graph G, one can efficiently find a straight-line drawing of G with $(1 + o(1))\overline{\mathrm{cr}}(G)$ pairs of crossing edges. This is joint work with Jacob Fox and Janos Pach. (Received September 18, 2017)