Discrete Mathematics Seminar

Time: Friday, 7 February 2014, 1:00 – 2:00 PM

Location: 238 Derrick Hall

Title: The (normalized) laplacian eigenvalue of signed graphs

Speaker: Dr. Ying Liu, Shanghai Lixin University of Commerce

Abstract:

A signed graph $\Gamma = (G, \sigma)$ consists of an unsigned graph $G = (V, E)$ and a mapping $\sigma : E \to \{+, -\}$. Let Γ be a connected signed graph and $L(\Gamma), NL(\Gamma)$ be its laplacian matrix and normalized laplacian matrix, respectively. Suppose $\mu_1 \geq \cdots \geq \mu_{n-1} \geq \mu_n \geq 0$ and $\lambda_1 \geq \cdots \geq \lambda_{n-1} \geq \lambda_n \geq 0$ are the laplacian eigenvalues and the normalized laplacian eigenvalues of Γ, respectively. We give two new lower bounds on λ_1 which are both stronger than Li's bound and obtain a new upper bound on λ_n which is also stronger than Li's bound. In addtion, Yao-ping Hou proposed a conjecture for a connected signed graph Γ: $\sum_{i=1}^{k} \mu_i > \sum_{i=1}^{k} d_i$ $(1 \leq k \leq n-1)$. We investigate $\sum_{i=1}^{k} \mu_i$ $(1 \leq k \leq n-1)$ and partly solve the conjecture.