Department of Mathematics, BGU

BGU Probability and Ergodic Theory (PET) seminar

On Thursday, February ,15 2024

At 11:10 – 12:00

In 101-

Shlomo Hoory

will talk about

On the Girth of Graph Lfits

Abstract: The size of the smallest k-regular graph of girth g is denoted by the well studied function n(k,g). We suggest generalizing this function to n(H,g), defined as the smallest size girth g graph covering the, possibly non-regular, graph H. We prove that the two main combinatorial bounds on n(k,g), the Moore lower bound and the Erdos-Sachs upper bound, carry over to the new setting of lfits, even in their non-asymptotic form.

We also consider two other generalizations of n(k,g): i) The smallest size girth g graph sharing a universal cover with H. We prove that it is the same as n(H,g) up to a multiplicative constant. ii) The smallest size girth g graph with a prescribed degree distribution. We discuss this known generalization and argue that the new suggested definitions are superior.

We conclude with experimental results for a specific base graph and with some conjectures and open problems.

 $https://arxiv.org/abs/2401.01238^1$

¹https://arxiv.org/abs/2401.01238