

Number Theory & Combinatorics Seminar

Monday—November 5, 2012

Room: E575

Time: 12:00 to 12:50 p.m.

Speaker: Farzad Aryan (University of Lethbridge)

Title: The distribution of k -tuples of reduced residues

Abstract: Let q be a natural number, and write $P = \varphi(q)/q$, that is P is the probability that a randomly chosen integer is relatively prime to q . Let $1 = a_1 < a_2 < \cdots < a_{\phi(q)} < q$ be the reduced residues mod q (integers co-prime to q in increasing order). A quantity of central interest is

$$V_\gamma(q) = \sum_{i=1}^{\phi(q)} (a_{i+1} - a_i)^\gamma.$$

In 1940, Erdős conjectured that $V_\gamma(q) \ll qP^{1-\gamma}$. Let

$$\mathcal{D} = \{h_1, h_2, \dots, h_s\}$$

be an admissible set. We call $a + h_1, \dots, a + h_s$ an s -tuple of reduced residues, if each of these numbers is co-prime with q . Study of s -tuples of reduced residues is an analogue to the study of s -tuples of primes. In this talk we prove estimates about the distribution of s -tuples of reduced residues and finally we prove an extension of Erdős's conjecture for s -tuples:

$$V_\gamma^{\mathcal{D}}(q) := \sum_{a_i < q} (a_{i+1} - a_i)^\gamma \ll qP^{-s(\gamma-1)},$$

where the sum runs over the integers $1 = a_1 < a_2 < \cdots < q$ for which $a_i + h_1, \dots, a_i + h_s$ is an s -tuple of reduced residues.

EVERYONE IS WELCOME!

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<http://www.cs.uleth.ca/~nathanng/ntcoseminar.html>