

DISCRETE MATHEMATICS SEMINAR
CENTER FOR APPLIED MATHEMATICS AND SCIENCE
DEPARTMENT OF MATHEMATICS
UNIVERSITY OF WEST GEORGIA

11:00 - 11:50 AM, Wednesday, March 09, 2016

BOYD 306

Speaker: Dr. Akira Saito

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Title: Precoloring extension involving pairs of vertices of small distance

Abstract:

A coloring of a graph G is an assignment of colors to the vertices of G in such a way that every pair of adjacent vertices receive different colors. If G admits a coloring using r colors, G is said to be r -colorable,

Graph coloring has a number of applications. In many of them, we encounter a situation in which several vertices of G are already colored. We are required to find a coloring which does not alter the colors of these vertices. This problem is called a precoloring extension.

Even if a graph G is r -colorable and the precolored vertices are colored in r colors, we often need more than r colors to extend it. But Albertson (1998) proved that if each pair of precolored vertices has distance at least four, then there exists an extension using $r + 1$ colors.

In this talk, we extend Albertson's work and consider the situation in which some pairs of precolored vertices have distance less than four. In this case, we cannot guarantee the existence of an extension using $r + 1$ colors. We investigate the effect of pairs of vertices of distance three and two and seek for upper bounds of the number of colors in the extension.