WORKSHOP ON GRAPH THEORY AND ITS APPLICATIONS - VIII

Date : November 9-10, 2018
Place: IMBM Seminar Room, Boğaziçi University South Campus
Participation is free, please register on our web page `http://bilmuh.gtu.edu.tr/~dgozupek/wgt2018/`

PROGRAM

November 9, 2018, Friday

10.00-12.15 (with a coffee break): Invited lecture: The Generalised Colouring Numbers
Sebastian Siebertz (University of Warsaw, Poland)

Abstract:

The *colouring number* col(G) of a graph G is the minimum integer k such that there exists a linear order L of the vertices of G for which every vertex v has *back-degree* at most k - 1, i.e., at most k - 1 neighbours u with $u <_L v$. It is well-known that for any graph G, the chromatic number $\chi(G)$ satisfies $\chi(G) \leq$ col(G), which explains the name "colouring number". We study generalisations of the colouring number that were introduced by Kierstead and Yang in the context of colouring games and marking games on graphs. These *generalised colouring numbers* intuitively measure reachability properties in a linear vertex ordering of a given graph. Such an ordering yields a very weak and local form of a graph decomposition which can be exploited combinatorially and algorithmically. In particular, the generalised colouring numbers play a key role in the theory of bounded expansion and nowhere dense graph classes. In this talk I will give an introduction to the generalised colouring numbers and their applications. These applications include the construction of *sparse neighbourhood covers*, winning strategies in a game called the *Splitter Game* and *odd distance colourings* of graphs. I will conclude with the presentation of open problems in the area.

14.00-17.00: Contributed talks

November 10, 2018, Saturday

10.00-11.00: Invited lecture: Roman Domination in Graphs
Joanna Raczek (Gdansk University of Technology, Poland)

Abstract:

A *Roman dominating function* on a graph $G = (V, E)$ is defined to be a function $f: V \to \{0, 1, 2\}$ satisfying the condition that every vertex u for which $f(u) = 0$ is adjacent to at least one vertex v for which $f(v) = 2$. The weight of a Roman dominating function f is the value $f(V) = \sum_{u \in V} f(u)$. The minimum weight of a Roman dominating function on a graph G is called the *Roman domination number* of G. In this talk, I will present results on Romad domination and its variants in some classes of graphs. This talk will also feature future possible ways of continuing the study of these parameters.

11.00-11.15: Coffee Break

11.15-12.15: Invited lecture: On Domination Subdivision Number of Trees
Magda Dettlaff (Gdansk University of Technology, Poland)

Abstract:

Let $G = (V(G), E(G))$ be a graph. A subset D of $V(G)$ is said to be dominating in G if every vertex belonging to $V(G)$ - D has at least one neighbor in D. The cardinality of a smallest dominating set in G, denoted by $\gamma(G)$, is called the domination number of G. The domination subdivision number, sd(G), of a graph G is the minimum number of edges which must be subdivided (where each edge can be subdivided at most once) in order to increase the domination number. The domination subdivision number of a tree is either 1, 2 or 3. In this talk I focus on different kind of characterizations of trees with the domination subdivision number equal to 3.

14.00-17.00: Contributed talks