PETER DANZINGER, Ryerson University

Some recent results on the Hamilton-Waterloo Problem

Given a graph G, a C_n-factor is a spanning subgraph of G each component of which is isomorphic to the n-cycle C_n. A factorization of G is a set of factors that between them partition the edges of G. Let K_v^* be the complete graph on v vertices if v is odd and $K_v - I$, where I is a 1-factor, when v is even.

Given non-negative integers v, m, n, α, β, the Hamilton-Waterloo problem, HWP$(v; m, n; \alpha, \beta)$, asks for a factorization of K_v^*, or, into α C_m-factors and β C_n-factors. Clearly, $v, n, m \geq 3$ must be odd, $m \mid v$, $n \mid v$ and $\alpha + \beta = (v-1)/2$ are necessary conditions. Without loss of generality we may assume that $n \geq m \geq 3$.

Recently we showed that the necessary conditions where (mostly) sufficient when m and n are odd and v is a multiple of n and m. More recently we have considered the case where v is not a multiple of n and m, we also have new results in the case where m and n have opposite parity.

Joint Work with A. Burgess and T. Traetta.