Programm 14. SEG Workshop am 21. Januar 2014

Chance Constraint Models for Multi-Failures in the Design of Communication Networks (15:30 Uhr)

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For a given network topology we suppose that the data stream is disrupted by failure of components of the network or exterior forces leading to failures, which both can occur with a certain probability. For each node pair of the network a routing subgraph has to be determined such that the overall loss of data due to events that lead to failures is small with high probability. We present a cutting plane and a robust approach which yield reasonably good solutions assuming that the failures are caused by at most two events.

Das Zählen von zweifach kantenzusammenhängenden Graphen (16:00 Uhr)

Peter Tittmann (Hochschule Mittweida)
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Hanlon und Robinson (1982) beschrieben ein Verfahren zur Zählung zweifach kantenzusammenhängender Graphen gegebener Ordnung. Diese Methode nutzt die Abzähltheorie von Polyá in Verbindung mit der Möbiusinversion. Bergeron, Labelle und Leroux (1998) nutzen die Theorie der kombinatorischen Spezies, um dieses Ergebnis zu erzielen. Wir stellen hier ein elementares Verfahren zur Bestimmung der Anzahl der zweifach kantenzusammenhängenden Graphen vor, das keine erzeugenden Funktionen verwendet.

Pause (16:30 Uhr)

A discrete gradient-method approach to the Fermat-Torricelli problem (17:00 Uhr)

Margarita Spirova (TU Chemnitz)
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The well known Fermat-Torricelli problem refers to the unique point having minimal distance sum to a given finite set of points in d-dimensional space. We give a discrete geometric (differential-free) proof of the theorem characterizing the solution of this problem. Using this discrete approach, we extend the Fermat-Torricelli problem to the case that the given points are replaced by affine flats of various dimensions.

The talk is based on joint work with Yaakov S. Kupitz (Jerusalem) and Horst Martini (Chemnitz).

Rainbow connection and size of graphs (17:30 Uhr)

Ingo Schiermeyer (Technische Universität Bergakademie Freiberg)
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An edge-coloured connected graph G is called *rainbow-connected* if each pair of distinct vertices of G is connected by a path whose edges have distinct colours. The *rainbow connection number* of G, denoted by $rc(G)$, is the minimum number of colours such that G is rainbow-connected. In this talk we consider the following problem:

Problem For all integers n and k with $1 \leq k \leq n-1$ compute and minimize the function $f(n,k)$ with the following property: If $|V(G)| = n$ and $|E(G)| \geq f(n,k)$ then $rc(G) \leq k$.

For n and k with $1 \leq k \leq n-1$ it holds that $f(n,k) \geq \binom{n-k+1}{2} + k - 1$. It has been shown that $f(n,k) = \binom{n-k+1}{2} + k - 1$ for $k = 1, 2, 3, 4$ and for $n - 6 \leq k \leq n - 1$.

In this talk we will report about these results and show some further recent progress obtained for this problem.

Abendessen im Turm-Brauhaus (18:30 Uhr)