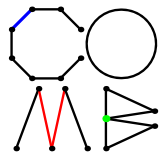

2013 年度

第 4 回 九州大学 組合せ数学セミナー

Hakata Workshop 2014[1]

下記のようにセミナーを開催しますので, ご案内申し上げます。

世話人:	溝口 佳寛（九大 IMI）	脇 隼人 (九大 IMI)
	渋田 敬史（九大 IMI）	谷口 哲至（松江高専）
	島袋 修（長崎大）	田上 真（九州工大）
	栗原大武（北九州高専）	千葉周也 (熊本大)
アドバイザー：	坂内 英一（上海交通大学/九大数理）	

記

日時: 2014 年 2 月 8 日 (土) 9:15–17:30
場所:Seminar Room R (4F) in Reference Eki Higashi Building (1-16-14 Hakata-Eki-Higashi, Hakata-Ku, Fukuoka City, 812-0013)
URL: `http://comb.math.kyushu-u.ac.jp/`

プログラム

9:15–9:20 Opening （Tetsuji Taniguchi）

9:20–10:00 Shoichi Tsuchiya (Tokyo University of Science)
On Halin graphs and generalized Halin graphs

10:10–10:50 Shuya Chiba (Kumamoto University)
On the number of components of 2-factors in claw-free graphs

11:00–11:40 Masashi Shinohara (Shiga University)
On complementary Ramsey numbers

13:10–14:40 Poster Session
Software in Mathematics Demonstration Track

15:00–15:40 Michio Seto (Shimane University)
Graph homomorphisms and de Branges-Rovnyak theory

15:50–16:30 Jong Hyeon Seo (Pusan National University)
The Convergence of Relaxed Functional Iterations for Solving Quadratic Matrix Equations with an M-matrix

[1] This conference was supported by Laboratory of Advanced Software in Mathematics, Institute of Mathematics for Industry, Kyushu University, JSPS KAKENHI(Grant-in-Aid for Exploratory Research) Grant Number 25610034 and JSPS KAKENHI(Grant-in-Aid for Scientific Research (C)) Grant Number 25400217.

16:40–17:20 Shun'ichi Yokoyama (Kyushu University)
Computing resultant matrix of general multivariate polynomials and its determinant using Magma

17:20–17:30 Closing（Yoshihiro Mizoguchi）

18:00 – Post-meeting party

Poster Session

Theme: Software in Mathematics Demonstration Track
Speakers and Titles:

1. 岩下 寛弥 (九州大学大学院工学府海洋システム工学専攻) HEAP モデル法によるプル型スケジューリングプログラム
2. 山岡 幸高 (九州大学数理学府) 構文解析に特化した翻訳ソフト
3. 大塚 寛 (愛媛大学理工学研究科) TRDRD に基づくサッカーの分析ソフトウェア
4. Omar Rifki (Economic engineering department of Kyushu University) jPortRob, GetAssetsDataSet
5. 吉野 聖人 (松江工業高等専門学校 電子制御工学科) ラプラシアン固有マップ法における評価方法及びその応用
6. 田中 久治 (佐賀大学大学院工学系研究科) Coq Modules for Automata and Sticker Systems
7. Sang-Hyup Seo (Department of Mathematics,Pusan National University) THE MONOTONE CONVERGENCE OF NEWTON'S METHOD FOR DIFFERENTIABLE CONVEX MATRIX FUNCTIONS

Abstract

Shoichi Tsuchiya (Tokyo University of Science)

Title: On Halin graphs and generalized Halin graphs

Abstract: A *Halin graph*, defined by Halin, is a plane graph $H = T \cup C$ such that T is a spanning tree of H with no vertices of degree 2 where $|T| \geq 4$ and C is a cycle whose vertex set is the set of leaves of T. On the other hand, *generalized Halin graph* is a graph $H = T \cup C$ such that T is a spanning tree of H with no vertices of degree 2 where $|T| \geq 4$ and C is a cycle whose vertex set is the set of leaves of T. Note that some generalized Halin graphs may not be plane graphs, (for example, Petersen graph is a generalized Halin graph which is not planar). In this talk, we introduce some known results on Halin graphs and generalized Halin graphs. After that, we investigate difference between Halin graphs and generalized Halin graphs.

Shuya Chiba (Kumamoto University)

Title: On the number of components of 2-factors
in claw-free graphs Abstract: We consider only finite graphs without loops. A graph G is said to be *claw-free* if G has no induced subgraph isomorphic to $K_{1,3}$ (here $K_{1,3}$ denotes the complete bipartite graph with partite sets of cardinalities 1 and 3, respectively). A 2-*factor* of a graph G is a spanning subgraph of G in which every component is a cycle.

It is a well-known conjecture that every 4-connected claw-free graph is Hamiltonian due to Matthews and Sumner [Hamiltonian results in $K_{1,3}$-free graphs, *J. Graph Theory* **8** (1984) 139–146]. Since a Hamilton cycle is a 2-factor with one component, there are many results on the upper bounds of the number of components in 2-factors of claw-free graphs. In this talk, we will present some recent results on the relationship between the number of components of a 2-factor and the minimum degree of a graph.

Masashi Shinohara (Shiga University)

Title: On complementary Ramsey numbers Abstract: In this talk, we propose a new generalization of Ramsey numbers which seems to be untreated in the literature.Instead of requiring the existence of a monochromatic clique, we consider the existence of a clique which avoids one of the colors in an edge coloring.These numbers are called complementary Ramsey numbers, and we derive their basic properties.We also establish their connections to graph factorizations. This is a joint work with Akihiro Munemasa.

Michio Seto (Shimane University)

Title: Graph homomorphisms and de Branges-Rovnyak theory

Abstract: In 1960's, de Branges and Rovnyak developed a theory dealing with Hilbert space embedding $H_1 \hookrightarrow H_2$. In this talk, comparing with theory of univalent functions, a de Branges-Rovnyak framework for study of graph homomorphisms will be suggested. This is joint work with S. Suda and T. Taniguchi.

Jong Hyeon Seo (Pusan National University)

Title: The Convergence of Relaxed Functional Iterations for Solving Quadratic Matrix Equations with an M-matrix

Abstract: In stochastic areas, to find a special solution of a *quadratic matrix equation* (QME) under probabilistic constraints is one of important issues. In this paper, first, we show the monotonic convergence of the *successive approximation method* (SAM[1]) to the minimal nonnegative solution of QME under nonnegativity constraints which cover two different types of QMEs from probabilistic contexts, and explain theoretically why the SAM is always faster than the *fixed point iterative method* (FIM [2]) in numerical experimentations. Second, we present a relaxed SAM which also preserves the monotonic convergence to the solution. Finally numerical experimentations give the new method actually improves convergence rate and is effective.

参考文献

[1] Bai, Z.-Z., Guo, X.-X., and Yin, J.-F. On two iteration methods for the quadratic matrix equations. *Int. J. Numer. Anal. Model. 2* (2005), 114-122.

[2] Guo, C.-H. On a quadratic matrix equation associated with an M-matrix. *IMA J. Numer. Anal. 23* (2003), 11-27.

Shun'ichi Yokoyama (Kyushu University)

Title: Computing resultant matrix of general multivariate polynomials and its determinant using Magma Abstract: We produce an efficient program package to compute the resultant matrix and its determinant for a given pair of multivariate polynomials on Magma. This package works much more faster than the Magma's built-in function "Resultant" for multivariate polynomials. We also explain some applications of this package, and especially, try some benchmark problem for computing general formula of the discriminant. This work is in cooperation with Kinji Kimura (Kyoto University).