2017 年度
第 1 回 九州大学 組合せ数学セミナー
Hakata Workshop 2017; Summer Meeting[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）　谷口 哲至（広島工大）
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: 2017 年 6 月 17 日 (土) 13:43–17:35

場所:Seminar Room I (2F) in Reference Eki Higashi Building. 1-16-14 Hakata-Eki-Higashi, Hakata-Ku, Fukuoka City, 812-0013

プログラム

9:18–9:20 Opening （Tetsuji Taniguchi）

13:45–14:30 Michio Seto (National Defense Academy) (this is joint work with S. Suda)
An application of de Branges-Rovnyak space theory to graph theory

14:45–15:30 Koji Momihara (Faculty of Education, Kumamoto University)
Three-valued Gauss periods and related strongly regular Cayley graphs

15:45–16:30 Shoichi Kamada (Graduate School of Science and Technology, Kumamoto University)
Fractal analysis for subset sum problems

16:45–17:30 Yusuke Yamauchi (Hiroshima Institute of Technology)
On a regularity theorem for rectangular domain

17:30–17:35 Closing （Yoshihiro Mizoguchi）

18:00– Post-meeting party

Abstract

Michio Seto (National Defense Academy) (this is joint work with S. Suda)

Title: An application of de Branges-Rovnyak space theory to graph theory

Abstract: Let $G_1 \subset G_2$ be inclusion of two finite simple graphs. In this talk, we deal with inner product spaces encoding the data of the defect of G_1 in G_2. Our construction of those inner product spaces is based on de Branges-Rovnyak space theory in functional analysis. Further, applying the theory of quasi-orthogonal decomposition developed by de Branges and Vasyunin-Nikolskii, some inequalities concerning inclusion $G_1 \subset G_2$ are derived.

Koji Momihara (Faculty of Education, Kumamoto University)

Title: Three-valued Gauss periods and related strongly regular Cayley graphs

Abstract: It is well-known that the Cayley graph on a finite field with the set of zeros of a nondegenerate elliptic quadratic form as its connection set is strongly regular. Recently, Bamberg, Lee, Xiang and the speaker found new strongly regular Cayley graphs by halving the elliptic quadric. Two-valued Gauss periods and a partition of a conic are behind this construction. In this talk, we show that the construction can be also done within the framework of three-valued Gauss periods. As a consequence, we obtain two new infinite families of strongly regular Cayley graphs.

Shoichi Kamada (Graduate School of Science and Technology, Kumamoto University)

Title: Fractal analysis for subset sum problems

Abstract: The subset sum problem has several aspects such as combinatorial aspects, number theoretic aspects, and so on. In this talk, we estimate the information dimension for the subset sum problem, which gives the aspect of fractal analysis. For the equation of the subset sum problem, it can be considered that the probability distribution of their coefficients comes from that of fractional parts of real numbers. We show that this enables us to estimate the information dimension.

Yusuke Yamauchi(Hiroshima Institute of Technology)

Title: On a regularity theorem for rectangular domain

Abstract: There exists a large amount of literature on a regularity theorem of elliptic boundary value problem on smooth domains. In the field of elliptic partial differential equation, non-smoothness of the domain has some difficulties, and there are few results. In this talk, we show a regularity theorem on rectangular domain.