List of Dissertation Abstract

（Information Media and Environment Sciences　Environmental Mathematical Analysis Course）

Name	Supervisor	Title	Abstract
Xihe LIU	Takashi NISHIMURA	A Study on Spherical Orthotomic Curves	For the n-dimensional spherical pedal curve pedγ,P with respect to an n-dimensional spherical unit speed curve γ and a given point P in Sn, we define the spherical orthotomic curve of γ relative to the point P, and classify singularities of spherical orthotomic curves.
Yuta OMIZO	Atsuhiro NAKAMOTO	Y-equivalence classes and geometric realization of quadrangulations on the projective plane	A quadrangulation G on the surface is k-minimal if the length of a shortest essential cycle is k, and any face-contraction in G breaks this property. It is known that any two k-minimal quadrangulations on the projective plane can be transformed into each other by a sequence of Y-rotations. In this paper, we give a new Y-equivalence class. Moreover, we show that graphs in such classes are related to rhombus tilings of a point-symmetric convex polygon.
Yudai KITAMURA	Junji NUKATA	In terms of high school graduates who went on to universities, a study on how to see national, prefectural and other public universities of science and engineering according to the distance between the universities and annual enrollment limits.	I studied how to see national, prefectural and other public university of science and engineering in terms of high school graduates who went to on the university in each prefecture or region and focused on the distance between the universities and annual enrollment limits of them. Moreover, I considered about the reality and problems of the moves for going on to university including concentration of Tokyo by comparing "how to see" university from each prefecture or region and the number of high school graduates who went on to university and motives of the candidates for admission to university.
Kohei SHIRAISHI	Minoru SHIRAZAKI	Three dimensional Numerical Analysis of Motion and Wave Dissipation Effect of Multiple Connected Floats	Three dimensional CFD (Computational Fluid Dynamics) analysis of the wave dissipation effect of lane rope connected multiple floats in swimming pool has been performed. This paper mainly discusses the relation among the wave dissipation effect of the lane rope floats, shape, and rotation. As a result of the analysis with different shapes of the floats, it was found that the floats with a shape of that is easy to rotate have more effective wave dissipation effect when the wave is small, but the floats with a shape that is hard to rotate have more effective when the wave is large.

Hayato SENDA	Shushi HARASHITA	Enumerating superspecial Howecurves	We enumerate superspecial Howe curves over fields of relatively large characteristic. It is not known whether there exists superspecial curve of genus 4 over any characteristics, and the enumeration has been done only over very small characteristics. By considering Howe curves, we succeed in enumerating the curve over relatively large characteristics.
Masayoshi DOKI	Atsuhiro NAKAMOTO	Graph grabbing game on graphs with forbidden subgraphs	A graph grabbing game is a two-player game on weighted connected graphs. In the game, they alternately remove a non-cut vertex from the graph (i.e., the resulting graph is still connected) and get the weight assigned to the vertex. Each player's aim is to maximize his/her outcome, when all vertices have been taken. It is known that the first player Alice can win the game on several graphs with any weights. In this paper, we show that Alice can win the game on graphs with any weights if certain subgraphs are forbidden. We introduce the relevance of the result and the previous results.
Michihito YOKUDA	Seiya NEGAMI	Looseness of 6-regular triangulations on the torus	The looseness of a triangulation on a closed surface ,denoted by $\xi(G)$, is defined as the minimum number k such that for any surjection $c:V(G)\rightarrow\{1,2,...,k+3\}$, there is a face whose three vertices receive three distinct colors. We show that $\xi(G)=\alpha(G)-1$,for a 6-regular triangulation G on the torus.
Yijia GAO	Takashi NISHIMURA	A Study on Toroidal Helices	Helix in 3-dimensional space is a classical topic in differential geometry. In the first year of my master study, I studied about the properties of helix, using the evolute and the involute to think about it. In this thesis, I study a new type of helix, which is much more standard. It is concentrated on one class of the extended helix, where the base curve of the extended helix is the base circle of a standard torus.