List of Dissertation Abstract (Dissertation Doctor)

Name	Supervisor	Title	Abstract
TSUKINO Makoto	YAMADA Takahiro	Development of Contact Procedure in Voxel-based Structural Analysis	A frictionless contact procedure in the voxel-based structural analysis is developed. The finite cover method is employed in order to manage geometry of contact surface properly without losing capability of mesh generation. The Nitsche's method is applied to contact constraint and it is shown that the Nitsche's method is superior to the simple penalty method in terms of accuracy and calculation cost. Besides, an algorithm using iterative linear equation solver with stabilization technique is proposed from the viewpoint of practical use. Basic and practical contact problems are calculated to show the effectiveness of the proposed procedure.

ITO Yushi	OKA Yasushi	Studies on Estimation of Cardiorespiratory Load Based on Heart Rate Variability Analysis During Firefighting Activity	The purpose of this study was to propose the method to evaluate the cardiorespiratory load of firefighters. The reflection index of respiratory (RIR), which can be acquired noninvasively based on heart rate variability, was proposed for indicating anaerobic status. By monitoring the variation of RIR, respiratory metabolism status and blood lactate can be evaluated. In addition, evaluation method for respiratory metabolic status which determines whether firefighters continue or stop their activities based on two variables that can be measured during firefighting activities was proposed. Its validity was verified by applying it to simulated firefighting activities.

HIRATA Daiji	MAJIMA Ryuichi	Depositional age of accretionary prism and forearc basin sediments in the forearc region on Miura and Boso Peninsula, south Kanto, Japan	A detailed review of the Miocene accretionary prism, Miocene trench slope sediments, and forearc basin sediments on the Miura and Boso Peninsulas. Zircon U-Pb dating of the basal layer of the forearc basin sediment was measured. As a result, it was found that the trench slope sediments and forearc basin sediments of both peninsulas are continuous sediments. The apparent separation of trench slope sediments and forearc basin sediments due to the start of subsidence of the forearc basin was about 15 Ma on the Boso Peninsula and about 6 Ma on the Miura Peninsula, showing a difference of about 9 million years. The finding that the forearc basins of both peninsulas are formed at different times imposes important restrictions on the structural development history of the Kanto sedimentary basin.

SAKATA Kosuke	HARASHITA Shushi	Efficient signature-based algorithms for computing Gröbner bases	Gröbner bases is a field of algebra, defined for ideals on polynomial rings and has special properties. The main theme of this paper is signature-based algorithms, which is one of the algorithms for finding Gröbner bases. We proposed signature-based algorithms with simple proofs of termination and correctness. We also proposed an efficient method of calculation that is effective for signature-based algorithms.