（様式 5）

指導教員 承認印	金子

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学位（博士）論文要旨

(Doctoral thesis abstract)

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論 文 題 目 (Title)	Recommendation of Appropriate Images for Vocabulary Learning （語彙学習に適切な画像の推薦に関する研究）

論文要旨（2000 字程度）
(Abstract(400 words))
※欧文・和文どちらでもよい。但し、和文の場合は英訳を付すこと。
(in English or in Japanese)

This dissertation reveals strategies to recommend appropriate images for foreign vocabulary learning. It mainly focuses on images that can be utilized for the memorization of nouns in a new foreign language. Two types of nouns (concrete and abstract) have been investigated. For concrete nouns, first, a definition of an appropriate image to represent a noun is proposed. After that, an algorithm that is able to judge on still images and determine the most appropriate one is designed. For abstract nouns, first approach worked on a hypothetical definition of an appropriate image. The second approach worked on the feature-based categorical recommendation method for the recommendation of appropriate images to represent an abstract noun. An appropriate image recommendation system has been developed that recommend appropriate images for foreign vocabulary learning. Evaluations with the subsets of both concrete and abstract nouns have been carried out to assess the learning effect of the appropriate images.

In Chapter 1, a general introduction on “the importance of foreign language learning in linking to the roles of vocabulary”, “roles of noun acquisition in language development”, “power of visual aids in word memorization”, “aspects of noun imageability from the perspective of language pedagogy”, and “summarization of the contributions” are articulated.

In Chapter 2, state-of-the-art in the foreign vocabulary learning domain by taking into

account “technology-driven researches on learning system development”, “representation of multimedia annotations” and “emerging technologies developed from the year 2005 and 2017” are articulated.

In Chapter 3, the theoretical background of this study including the “research paradigms (approaches)”, “pedagogical investigations”, “proposed definition of an appropriate image for representing a concrete noun”, “proposed a hypothetical definition of an appropriate image for representing an abstract noun”, “motivation for adapting the categorical recommendation-based method” are discussed.

In Chapter 4, technological developments by introducing “Appropriate Image-based Vocabulary Acquisition System (AIVAS)”, “Design of AIVAS-Image Reranking Algorithms”, “Implementation of AIVAS-Image Reranking Algorithms”, “AIVAS-Appropriate Image Recommendation System”, “AIVAS Imagesets”, “AIVAS Learning Material Creator” are thoroughly discussed.

In Chapter 5, concisely discussed on the 4 evaluation experiments by articulating “experimental procedures”, “method”, “materials”, “participant details”, “data collection”, “data analysis” and “results”.

In Chapter 6, related aspects on “the appropriacy of images in memorizing vocabulary from the other parts of speech (such as, verbs, adjectives, adverbs etc.)” and “why the current appropriate image recommendation approaches are not tested with them” are briefly discussed.

In Chapter 7, a conclusion of this study by “summarizing the research outcomes” is articulated.

In Chapter 8, “limitations of the current study” and “ideas to overcome them in future” are highlighted.

（英訳）※和文要旨の場合（400 words）