List of Dissertation Abstract (Information Media and Environment Sciences)

Name	Supervisor	Title	Abstract
Yujie LU	Tatsunori MORI	Social Media Sentiment Analysis: Multilingual Methodology and Monolingual Application	In this dissertation, we first construct an annotated multilingual corpus for deeper sentiment understanding that encompasses three languages (English, Japanese, and Chinese) and four international topics (iPhone 6, Windows 8, Vladimir Putin, and Scottish Independence). Then, we propose a new deep learning paradigm to assimilate language differences for multilingual sentiment analysis. We first pre-train monolingual word embeddings separately, then map word embeddings in different spaces into a shared embedding space, and finally train parameter-sharing deep neural networks. The experimental results show that our paradigm is effective. Finally, we apply monolingual sentiment analysis to unfolding public mood on social issues from microblogging for stock market sector index prediction. The experiments on ``food safety" issue show that the proposed method outperforms the word-level baseline in predictive power.
Masanori SUGANUMA	Tomoharu NAGAO	A Study on Salient Event Detection in Videos	A lot of videos are recorded in many public places such as airports, stations, and operating rooms for security and postoperative evaluation. To utilize these videos effectively, automatic event detection methods are essential. In particular, it is important to detect events which occur less frequently and important events. We refer to these events as salient events in this paper and propose methods to detect these salient events.
Shinichi YONEKURA	Atsuhiro NAKAMOTO	Minor relation for quadrangulations on closed surfaces	In this paper, we proved that every bipartite quadrangulation on the projective plane can be reduced to either K3,4 or K- -4,4, every non-bipartite quadrangulation can be reduced to K4 by using two minor operations. Furthermore, we could show a sufficient condition for a bipartite quadrangulation on the projective plane to have a K3,4-minor by a single forbidden structure called the Q-structure.
Shinya WATANUKI	Tomoharu NAGAO	Utilizing Evolutionary Artificial Neural Network Models for Alternative Approach of Brand Equity Engineering	This study aims to develop a novel approach for constructing brand equity measurement (BEM) models by incorporating evolutionary neural networks (ENNs). We demonstrated that applying ENNs is an effective approach of implementing BEM models form viewpoints of Information science as well as brand strategy, consumer information processing.

Satomi SAITO	Tsutomu MATSUMOTO	Detecting Malicious Behavior by Analyzing Relations among Multiple Servers Log	Attacks on cyber space have become aggressive and sophisticated. Therefore, it is required new techniques for detecting malicious behavior from innumerous and various security log. This paper presents the techniques for detecting malicious behavior from security log mixed with normal, malicious and unknown records. Our approach focuses on the relations among multiple servers log. As a result, we report that our methods can detect stealthy attack instances that it is difficult to detect with existing tools and that were not recognized widely.
Shunsuke ICHIKI	Takashi NISHIMURA	A study on generic mappings under constraint conditions from the viewpoint of Singularity Theory	In Structural stability problem posed by René F. Thom (1923-2002), a stability of generic mappings in mapping spaces is investigated. On the other hand, in this dissertation, some properties of generic mappings under constraint conditions are investigated from the viewpoint of Singularity Theory. As some results on generic mappings under constraint conditions, some assertions on generic linear perturbations and some properties of generic quadratic mappings of special types are given.
Yusuke NATSUI	Tomoharu NAGAO	Automatic Construction of Single Frame Super-Resolution Using Evolutionary Computation	Single frame Super-Resolution (SR) is a technique to generate a high quality high-resolution image from a low-resolution image. It is practical for a lot of applications, and is studied widely. In general, however, single frame SR has trade-off between image quality and computational cost. We propose a method for automatic construction of high speed and high precision SR operation that can be implemented with a small circuit, by realizing SR operation using evolutionary computation in accordance with training images.