HICSS 2025 Symposium on

Computational Social Science

January 7th, 9am – 12pm @ Kona 4, Hilton Waikoloa Village

Chaired by Fujio Toriumi, The University of Tokyo, Organizer

Program

9:00 – 9:05 Opening Talk: **Isamu Okada, Soka University, Organizer**

9:05 – 9:25 Invited Talk: **Kei Ichikawa**

How Emotion Shapes the Sharing of AI-Generated Images: Findings from an Online Experiment

9:25 – 9:45 Invited Talk: **Hiroko Yamano**, The University of Tokyo

Beyond Pairwise Limits: Hypergraph modeling of Complex Interactions in the Human Musculoskeletal System

9:45 – 10:05 Invited Talk: **Atushi Ishikawa**, Kanazawa Gakuin University

Statistical relationship between the area enclosed by a moving trajectory and its perimeter

10:05–10:25 Invited Talk: **Itsuki Noda**, Hokkaido University, Riken

Possibility of Social Simulation for Real Application

10:25 – 10:55 Coffee Break

10:55 –11:15 Invited Talk: **Hiroki Miyabe**

Exploring Sociolinguistic Variation Theory in Song Lyrics: A 77-Year Analysis of the Billboard Charts

11:15 –11:35 Invited Talk: **Kazuhuiro Ito**, Nara Institute of Science and Technology

Estimating collective identity focusing on linguistic innovation

11:35–11:55 Invited Talk: **Yoshinori Hijikata**, University of Hyogo

Cross-language comparison of the posting style of political-related posts on Twitter

11:55 –12:00 Closing Talk: **Dongwoo Lim, Tsuda University, Organizer**

Abstract

How Emotion Shapes the Sharing of AI-Generated Images: Findings from an Online Experiment

Kei Ichikawa, Jiayu Chen, Kazutoshi Sasahara

The rise of generative AI has amplified misinformation challenges, particularly through deepfakes. While prior research on misinformation focused on emotional effects in text, our study shifts attention to the emotional valence in images, and we found that negativity in images plays a key role in the sharing behaviors of AI-generated content. By substituting negative imagery with non-negative alternatives, we observed a significant reduction in one' intention to share AI-generated disinformation. These findings suggest that regulating the emotional valence of visual content, especially negative affect, may serve as a critical factor in controlling the spread of AI-generated misinformation.

Beyond Pairwise Limits: Hypergraph modeling of Complex Interactions in the Human Musculoskeletal System

Hiroko Yamano, Shu Liu, Fujio Toriumi (The University of Tokyo)

The musculoskeletal network is a complex system of different types of nodes and edges interacting with each other. Although there is a wealth of knowledge about the anatomical components of the human body and the connections between them, the interdependence of these components as a system remains largely unexplored. This study aims to understand the structure and dynamics of musculoskeletal networks by using hypergraphs as a model of the musculoskeletal system with many-to-many connections. Experiments demonstrated the superiority of the hypergraph-based method over pairwise methods in distinguishing the specific roles of the muscles connecting different body parts.

Statistical relationship between the area enclosed by a moving trajectory and its perimeter

Atushi Ishikawa, Shouji Fujimoto (Kanazawa Gakuin Univ.),
Takayuki Mizuno(NII),Yoshimi Tanaka(Kanazawa Gakuin Univ.)

Observing the shapes formed by movement trajectories collected by GPS and other means, we notice that long-distance movements tend to be long and thin in one dimension, while short-distance movements tend to enclose a large area, like a circle. These can be described as a statistical relationship between area and perimeter, and can be characterized by the exponent of how the area is proportional to the perimeter. From data for several cities in Japan, these indices are observed to be approximately 2 for short-distance movements and approximately 1.5 for long-distance movements. In addition, the indices for long-distance movements differ between weekdays and holidays, decreasing on holidays in a city with large theme parks (Urayasu) and increasing in tourist cities (Kyoto and Kanazawa).

Possibility of Social Simulation for Real Application

Itsuki Noda (Hokkaido University, Riken), Nobuyasu Ito (Riken)

Social Simulation, particularly Multiagent Social Simulation (MASS), holds significant potential for analyzing and designing social phenomena and services. In this talk, we present several applications of MASS for designing social services in public transportation and disaster response.

MASS enables the design of novel transportation services and disaster evacuation plans, both of which face challenges due to the lack of big data—stemming either from non-existent services or rare events. Additionally, MASS facilitates detailed reconfiguration of existing services and plans by leveraging big data to achieve improvements.

These capabilities will contribute to smarter social design, preparing us for a future likely to be characterized by rapid and frequent changes.

Exploring Sociolinguistic Variation Theory in Song Lyrics: A 77-Year Analysis of the Billboard Charts

Hiroki Miyabe

We examine sociolinguistic variation theory using the song lyrics listed on the Billboard Year-End Charts from 1946 to 2022. Prior studies have shown that linguistic and non-linguistic factors (e.g., speech style, demographics) can cause variation in pronunciation. The reason why we uses lyrics is that not like other text data, lyrics are texts intended for spoken

performance and make it easy to get the speakers' demographics. Here we analyze factors that make differences between the "ing" [ɪŋ] and "in'" [ɪn] pronunciations. The results indicate that part of speech, the morality of word, and music genre contribute to this variation.

Estimating collective identity focusing on linguistic innovation

Kazuhuiro Ito, Shuntaro Yada, Shoko Wakamiya,
Eiji Aramaki (Nara Institute of Science and Technology)

Collective identity is known to influence people's cognition and behavior. In recent years, with the growth of social media, the importance of investigating collective identity within online communities has increased. The previous study on estimating collective identity from large-scale data proposed an index using LIWC, but it requires continuous updating of the corpus and is difficult to handle new words, low-frequency words, and multi-language. Therefore, as a new index, we hypothesize that a collective identity score can be estimated based on the frequency of innovative use of language within a community (Linguistic Innovation), based on the findings of psycholinguistics.

Cross-language comparison of the posting style of political-related posts on Twitter

Yoshinori Hijikata (University of Hyogo)

In this study, we investigated the posting styles and user accounts with high posting frequency of tweets on politics-related topics collected over a three-year period from January 1, 2020 to November 23, 2022 for five languages (English, French, Japanese, Hindi, and Portuguese). There were five posting styles: retweets, retweets with comments, replies, original tweets without URLs, and original tweets with URLs. Randomly sampled tweets by language (general topics) were collected for comparison. The results of the analysis showed that there were differences in the posting styles by language. In all languages, we found that retweets were more frequent for political topics than for general topics.