Workshop of "**Computing Society: examine the present and plan for the future**"

Venue: Room 802, Institute of Sociology, Academia Sinica

Dates: Mar 23-24, 2024

Program:

*subject to changes if necessary

	3/23 (Sat)	**3/24 (Sun)**
9:00 – 9:25	Reception	Reception
9:25 - 9:30	Opening Remarks	Announcement
9:30 - 10:10	Martin Everett (University of Manchester) **Computational Social Science: history, challenges and opportunities**	Hsuan-Wei Lee (Academia Sinica) **Health Communication on Social Media at the Early Stage of the Pandemic: examining health professionals' COVID-19 related tweets**
10:10 - 10:50	Yoshimichi Sato (Kyoto University of Advanced Science) **The Sociological Foundations of Computational Social Science**	Subhayan Mukerjee (National University of Singapore) **Informational Asymmetries in the Production and Consumption of Digital Media**
10:50 - 11:10	Break (photo shooting)	Break
11:10 - 11:50	Siqi Han (The Chinese University of Hong Kong) **Educational Sociology in the era of Big Data**	Wen-Chin Wu (Academia Sinica) **"Signaling Loyalty: the Chinese diplomats' retweets of official messages"**
11:50 – 13:30	Lunch Break	Lunch Break
13:30 – 14:10	Yang-chih Fu (Academia Sinica) **Contact Networks: a diary approach to understand social structures and actions**	Yuan Hsiao (University of Washington, Seattle) **Multiplex Networks of Gang Online-Offline Conflict Dynamics in the Digital Age: a mixed-methods abductive approach**
14:10 – 14:50	Yen-Sheng Chiang (Academia Sinica) **Cooperation and Coordination in Adaptive Networks: online behavioral experiments**	Yen-Sheng Chiang (Academia Sinica) **Understanding Criminal Networks: clustering, hierarchy and disruption**

14:50 – 15:10	Break	Break
15:10 – 15:50	Ta-Chien Chan (Academia Sinica) **Using Social Media and AI to Explore the Relationships among Sound Perception, Spatiotemporal Signatures, and Personal Traits for Acoustic Comfort and Quality of Life**	Takashi Kamihigashi (Kobe University) **Introduction to the Journal of Computational Social Science**
15:50 – 16:30	Mu-Jung Cho (Academia Sinica) **Enhancing Smartphone Screen Content Identification with the Screenomics 3.0 Framework**	Open Discussion: **For a Better Future of Computational Social Science?**
16:30 – 16:50	Break	Break (including transiting to the restaurant)
16:50 – 17:30	Open Discussion: **Challenges of Computational Social Science**	
17:30 – 18:00	Break	Farewell Dinner **Shin Yeh Shiao Ju Restaurant (欣葉小聚)♣** **CTBC Financial Park**
18:00 –	Dinner **Bei Yun Restaurant (北雲餐廳)▲** **Academia Sinica**	

Sociological traditions

Novel data collection and analysis

Political/health communication in Tweeter

Computational criminology

Special session

♣ https://www.shinyeh.com.tw/content/en/brand/Index.aspx?BrandId=3

▲ http://www.twbistro.com/index.html

Day 1
Morning

Computational Social Science: history, challenges and opportunities.

Martin Everett

Co-Director Mitchell Centre

School of Social Sciences

University of Manchester

There are a number of ways to define computational social science. Most agree on interdisciplinarity, the use of computers and the existence of big data as all being component parts, but few would give a formal definition. In this talk we will focus on some of the successes of the subject and discuss a number of challenges. When asking ChatGPT what is computational science it gives a pretty good definition but one of the things it goes on to say is “Network theory is central to computational social science…”. It is now true that social network analysis is fully mainstream and considered to be a major discipline in its own right. What is it about SNA that has put it into this central role? We shall try and answer this question and in so doing hopefully identify opportunities and lessons that can be applied to the whole of computational social science.

Sociological Foundations of Computational Social Science

Yoshimichi Sato

Kyoto University of Advanced Science

My talk delves into the intersection of computational social science (CSS) and sociology, illustrating how digital data analysis and agent-based modeling enhance sociological research. I highlight the strengths of CSS, like its ability to handle large-scale, continuous, and nonreactive data, which traditional methods cannot. This capability is exemplified in Chang et al. (2021), where mobile data analysis provided new insights into social inequality and infection rates. However, I also point out CSS's limitations, particularly its focus on behavior rather than the underlying meaning and beliefs. Thus, I emphasize that to bridge the gap between CSS and sociology, it is essential to incorporate actors' beliefs and interpretations into CSS models. This approach aligns with sociological traditions, as seen in Berger and Luckmann's (1966) theory of social construction of reality. I discuss the model by Goldberg and Stein (2018) as an example where agents in an agent-based model are endowed with an associative matrix to interpret and give meaning to behaviors, showcasing a more sociologically nuanced approach to CSS. I also refer to Christopher Bail's theory of cultural carrying capacity and examine how organizations can optimize their messaging to resonate with their target audience's frames, influencing the spread of ideas, values, and norms in society. Finally, my talk is summarized by proposing that focusing on meaning and interpretation enriches studies using CSS techniques and makes them more significant in sociology.

Studying School-to-work Transition in the Era of Big Data

Siqi Han

Department of Sociology, The Chinese University of Hong Kong

Siqi Han will present a series of her published and ongoing works that provide an overview of how unstructured big textual data can be collected and analyzed using computational social science methods in the research area of social stratification, specifically in the study of school-to-work transition. She will compare these new research projects with classical ones in the field and discuss how big data can answer traditional stratification questions that were previously not possible. Additionally, she will offer examples of cutting-edge research that further promotes this new research agenda in computational social science.

Contact Networks:
a diary approach to understand social structures and actions

Yang-chih Fu

Institute of Sociology, Academia Sinica

The boundaries and components of personal networks are always difficult to identify. While conventional studies often explore personal networks from relationship- or acquaintanceship-based points of view, contact-based perspectives could also unravel network structures and dynamics in a different manner. As an alternative to relationship and acquaintance networks, studying contact networks can be particularly revealing in the social media era as the emerging means of communication fosters fleeting social interactions and breeds contingent social networks. Based on such a contact perspective, a diary approach helps delineate personal networks using interactions (contacts) as the basic unit to distinguish the underlying nature of ties (edges) among actors (nodes). Although social media records also enable researchers to examine online interactions from the contact perspective, contact diaries remain an invaluable source as they facilitate deliberate research designs to obtain comprehensive information about both structures and actions in personal networks over time. In this talk I will review the rationale behind the contact perspective, introduce the design of contact diaries, explain how recent diary studies help strengthen sociological inquiries, and highlight how they could contribute to the broader literature when using analogies and metaphors from other disciplines.

Cooperation and Coordination in Adaptive Networks: online behavioral experiments

Yen-Sheng Chiang

Institute of Sociology, Academia Sinica

There has been a surge of interest in biological and social sciences in studying how adaptive networks driven by partner choice can facilitate the emergence of cooperation and coordination in social networks. In this talk, I will present two experimental studies on this topic. First, I applied adaptive networks to a well-known coordination problem in computer science—the graph coloring game, in which agents strive to be make decisions to be different from network neighbors. In an online experiment with human participants, I show that dynamic networks that allow people to switch network neighbors works more effectively and efficiently for solving coloring conflicts than static networks in which they are allowed to change color alone. In a second study this time on cooperation, I disentangle the duality of ways to update a network: link formation and link dissolution. Formulating an evolutionary game model and testing it in a behavioral experiment, I find that link dissolution works better than link formation in facilitating cooperation in social networks. Specific settings of the experiment designs will be elucidated, and implications of the two studies to computational social science will be discussed in the talk.

Using Social Media and AI to Explore the Relationships among Sound Perception, Spatiotemporal Signatures, and Personal Traits for Acoustic Comfort and Quality of Life

Ta-Chien Chan

Research Center for Humanities and Social Sciences, Academia Sinica

This study investigates the multifaceted factors influencing noise annoyance and its impact on perceived health outcomes. Utilizing the "Soundmap" chatbot, data was collected from participants via the LINE platform in Taiwan between May 16 and July 16, 2022. Participants engaged in sound recording, completed questionnaires, and provided information on personal traits, noise sensitivity, burnout status, sleep quality, and quality of life. Artificial intelligence facilitated sound feature extraction and identification. Analysis revealed associations between lower acoustic comfort and factors such as female gender, nocturnal sound exposure, urban land use, and certain sources of noise like machinery and vehicles. Conversely, higher acoustic comfort correlated with exposure to low-frequency sounds, natural sounds, silence, music, and human activity, particularly in rural areas and on weekends. Extroversion was linked to greater sound tolerance, whereas noise sensitivity was associated with lower tolerance. Linear regression and generalized linear models explored factors affecting burnout, sleep quality, and quality of life, indicating that respondents with better home environments, good health, improved daily acoustic comfort, and less noise exposure during the week reported higher quality of life. Conversely, higher personal burnout was associated with poorer health, prolonged weekly noise exposure, increased incidence of noise-induced illnesses, and neurotic traits. Overall, the findings underscore the detrimental effects of noise exposure on sleep quality, burnout, and quality of life, emphasizing the importance of addressing noise pollution in daily life.

Enhancing Smartphone Screen Content Identification with the Screenomics 3.0 Framework

Mu-Jung Cho

Research Center for Humanities and Social Sciences, Academia Sinica

The challenge of providing comprehensive media descriptions has long been considered a critical challenge in the realm of digital trace data research. The capacity for precise media experience descriptions and the efficiency in deriving these descriptions are both fundamental to research in this field of work. This is particularly true for screen tracking methodologies that aspire to detailed content analysis and the development of new theoretical frameworks. This study introduces a data processing and inference pipeline designed to streamline the analysis of screen data. Through the integration of computer vision, natural language processing, and large multimodal model techniques, this system enhances the accuracy and efficiency of content description generation. Employing data gathered from 153 adolescents and their parents, this study underscores the system's usefulness in capturing and characterizing food-related content within adolescents' media environment.

Health communication on social media at the early stage of the pandemic: examining health professionals' COVID-19 related tweets

Hsuan-Wei Lee

Institute of Sociology, Academia Sinica

Focusing on health professionals' tweets regarding COVID-19, this study examines whether and how the professionals' tweets are unique based on their identity as health experts. The data revealed that the infusion of health communication with political opinions, whether pro- or against certain political parties or health policies, is value-laden and may deviate from the original purpose of health communication. In addition, the sentiment analysis countered the intuitive thoughts that health experts are merely fulfilling their role as neutral encyclopedias without overly carrying any sentiments. We conclude by reflecting on the meaning of health communication in relation to the professionals' political stances.

Informational Asymmetries in the Production and Consumption of Digital Media

Subhayan Mukerjee

Department of Communications and New Media, National University of Singapore

With the irruption of digital platforms, the landscape of information consumption and production has experienced profound and transformative changes. For communication scholars, delving into the nuances of these evolving dynamics, especially in relation to political processes, is of paramount interest. In this talk, I will discuss two studies that draw on a variety of computational methods to explore how individuals engage with online information whilst navigating partisan and political divides. Our first study, based on the analyses of American Twitter (X) users, seeks to answer: is Twitter even political to start with? Our findings suggest, that in our haste to look at information consumption through the left/right binary and measure political polarization on these platforms, we have possibly overlooked a far more important antecedent - interest in politics. Counter conventional narratives, we find that not only is Twitter not polarized into Democrat and Republican camps, it is characterized by large-scale indifference to politics. In our second study, we turn to Facebook to understand news production - specifically how media outlets respond to audience engagement in choosing what news to publish. Our findings indicate that media responsiveness to audience signals is significantly shaped by the outlet's political inclinations, as well as by the nature of the topic, particularly whether it is political or not. We therefore find that the same divides that govern consumption choices also drive the production of news. Taken together, these two studies paint a holistic picture of the online news media landscape, and offer nuanced insights into the dynamics of consumption and production on digital platforms.

Signaling Loyalty: Chinese diplomats' retweets of official messages

Wen-Chin Wu

Institute of Political Science, Academia Sinica

In this article, we examine the retweeting behavior of Chinese diplomatic institutions and individuals. We argue that Chinese diplomats retweet official messages of the Chinese Ministry of Foreign Affairs as a means to demonstrate their loyalty to the party. As diplomats working in foreign affairs, they would like to advance to higher positions and are expected to adhere to the state's diplomatic guidelines and work towards achieving its goals. Consequently, when the state disseminates messages through Twitter, diplomats with career incentives will actively engage in promoting these messages by retweeting them. In addition, the twitting strategy would differ by the type of Twitter account and the rank of diplomats. Individual diplomats, driven by their personal incentive to seek promotion, tend to retweet with higher frequency in order to enhance their visibility on Twitter. On the other hand, the Twitter accounts of diplomatic institutions such as embassies or consulates are typically managed by individuals whose names are not explicitly displayed on the Twitter pages. Consequently, these institutional accounts generally exhibit lower tweet frequency compared to individual accounts. We test our argument with the data collected from the Twitter accounts related to the Chinese diplomats and diplomatic institutions in the period from 2020 to 2022.

Multiplex Networks of Gang Online-Offline Conflict Dynamics in the Digital Age: a mixed-methods abductive approach

Yuan Hsiao

Department of Communication, University of Washington, Seattle.

Social media is increasingly intertwined into people's lives, spurring questions about the relationships between online behavior and offline actions. We advance knowledge in conflict dynamics by using a multiplex network framework that conceptualizes online and offline gang relationships as co-constitutive networks—online and offline relationships often overlap and entangle in complex ways that influence behavior in both the virtual and real worlds. We propose a mixed-methods abductive approach for digital data that uses qualitative analyses to challenge and corroborate quantitative analyses of online gang conflict. Synthesizing data from Facebook posts by alleged gang members, maps of gang territory, and police records of offline shooting events, we show that online gang conflicts are not random attacks but targeted network relationships, and such online relationships are dependent on offline geographic relationships and shooting history relationships between gangs. Our mixed-methods approach further shows via qualitative analyses that the statistical network associations are based on cultural-specific language surrounding gang names and symbols, neighborhood streets, and prominent gang members. Our approach underscores how mixed-methods and qualitative approaches are essential in unpacking "big data" and computational methods in understanding the multiplex nature of group conflict.

Understanding Criminal Networks: clustering, hierarchy and disruption

Yen-Sheng Chiang

Institute of Sociology, Academia Sinica

Social network analysis has become an important tool to decipher how criminals are connected and organized. Of central interest include the following research questions: First, are criminals' networks more clustered than normal people's so as to preserve the secrecy of illegal conducts? Second, would we find status hierarchy in criminal groups as we witness in other legitimate economic organizations? Third, given a criminal network how can law enforcement agency disrupt it in an effective way? In this talk, I will demonstrate how I draw on data provided by law enforcement authorities in Taiwan and apply computational methods to address the questions above.

Introduction to the Journal of Computational Social Science

Takashi Kamihigashi

Center for Computational Social Science, Kobe University

The Journal of Computational Social Science was launched in 2018 from Springer with Kobe University's sponsorship. It received an impact factor of 3.2 and a five-year impact factor of 2.9 in 2023. This talk will provide foundational and background information about this journal.