

NTU Institute of Science and
Technology for Humanity (NISTH)

NISTH NEWSLETTER

The latest news, views, and announcements from NISTH

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NISTH INTERDISCIPLINARY COLLABORATIVE RESEARCH PROGRAMME

NISTH Seed Grant: Science and Tech to enhance Human Performance

AWARDEES

The NISTH Seed grant: Science and Tech to enhance Human Performance, aims at interdisciplinary research to magnify the effect of technology on humans, and thus, seeks for interdisciplinary collaborative projects that adopt, deploy, evaluate or develop AI, data science, robotics and autonomous systems, software, materials science combined with social science including ethics, empathy, policy, responsible innovation, human-factor design, human identity, creativity, global collaboration, societal values, inclusion and diversity, sustainability, and humanities approaches. The grant aims to uncover deep insights into:

- approaches that lead to enabling and equipping humans by harnessing science and technologies
- social, psychological and economic consequences that science, technologies and innovations have on humans
- ethical issues and policies implemented to deliberate the role of technologies to serve humanity;
- the conceptualisation and validation of technology-supported interventions to facilitate the digital transformation

After a rigorous evaluation by the evaluation team, two projects were selected to be funded:

Project 1: Socio Digital Framework for Urban Resilience

Project 2: Social Trust of Artificial Intelligence in East Asia (A Survey-Based Study)

Awardees will be funded in the range of SGD10,000 to SGD50,000 (excluding the contributed >\$5,000 in kind or cash from external partner affiliates) over a period of 1 year, or for longitudinal studies, 2 years.

Project 1: Social Trust of Artificial Intelligence in East Asia (A Survey-Based Study)

PI's:

- Sabrina Luk, *School of Social Sciences*
- Shannon Ang, *School of Social Sciences*

Outline:

This study revolves around public trust, which constitutes a fundamental aspect in the adoption of AI. Our study seeks to explicate how and why people confer a trust on AI-driven technologies. To approach this problem, we situate trust in a broad spectrum of what we call as socio-technical landscape. It refers to the arrangement of institutions, policy climate, and societal forces that shape the configuration of AI ecosystem. Our study posits that public trust in AI is not necessarily an issue of individual perception per se. Rather, public trust is deeply influenced by how the socio-technical landscape of AI is structured.

The proposed study is designed to assess the divergence of public trust in AI at two levels. First, we are interested in unpacking public trust in AI using a comparative analysis across East Asian countries where the development of AI-driven technologies is unprecedented. Second, due to the broadness of AI, we propose to study public trust in three specific sectors, namely autonomous vehicle, healthcare automation, and personalized fintech. They represent AI-driven technologies most intimate to users in which safety, security, and privacy play a crucial role in the social acceptance of AI as a whole.

This study is highly significant on three grounds. Scientifically, it delineates why public trust in AI differs across social and technical domains. Empirically, it generates new body of knowledge on the interplay between trust and governance of AI from the East Asian perspective. And practically, with evidence-based analysis on various AI policies, it will provide a solid framework for developing a socially responsible governance of AI.

Project 2: Socio Digital Framework for Urban Resilience

PI's:

- Kim Hye Kyung, *Wee Kim Wee School of Communication and Information*
- Sabrina Luk, *School of Social Sciences*

Outline:

Spearheaded by Revolution 4.0, cities are becoming more interconnected and digitalized through the fundamental transformation towards relying more on information technology and digital platforms to provide essential services to residents. Many countries have been heavily investing in the construction of smart cities that incorporate digital technologies into everyday urban life to bring about more responsive and reliable government services, enhanced productivity and efficiency in business, and better quality of life. To build a linkage between urban digitalization and resilience, we draw on the concept of sociotechnical resilience. It recognizes the multi-layered construction of city resilience as being constituted by (1) technical infrastructures that deliver essential services such as transportation, electricity, water supply, and telecommunication, (2) government institutions that build and operate these infrastructures, and (3) communities as a group of users of urban services that engage in socioeconomic activities for the livelihood of cities.

In times when cities around the world are growing more vulnerable than ever to disaster and crisis, the widespread phenomenon of urban digitalization begets a compelling question: How to build a resilient multi-factor ecosystem in the urban environment that can withstand and ideally alleviate the dire consequences brought by external factors? This question over arches the entire investigation to be pursued in this study. Here, we hypothesize that all-penetrating digitalization deeply embedded in the societal fabric and coupled with effective institutional governance could strengthen urban resilience during large-scale emergent situations.

SOCIAL TRUST IN AI



Since the new year, NISTH researchers have been hard at work in conducting cutting-edge, valuable in-house research. This aligns with our new prerogative to increase NISTH’s in-house research output while maintaining its role as a catalyst and operator of high-quality research. In doing so, we are proud to announce the commencement of a NISTH-led project on Social Trust in AI utilising unused funds from NISTH grants.

What does it mean for us, as human users and, arguably, producers or even prosumers, to trust an AI system? Is trust possible between humans and nonhuman entities, or do we rely on nonhuman entities instead? What exactly is trust, and what does it affect in our interactions with the world? These are the central questions of the project. NISTH is particularly interested in how different types of trust converge in generating the public’s perception and, in extension, usage intention of AI products. In this project, NISTH examines the effects of socio-political institutions on different types of trust across different types of AI products.

Research at such scale and abstraction wants for a large, interdisciplinary team of experts to be at the helm. To this effect, NISTH is proud to announce that this project is overseen by Principal Investigators, Asst Prof Sabrina Luk (PPGA, SSS), Assoc Prof Kay Kim (WKWSCI), and Asst Prof Shannon Ang (SOCl, SSS). NISTH’s Acting Director, Assoc Prof Sulfikar Amir (Sociology) serves as the project leader. Contributing to the project are also NISTH’s own researchers, Postdoctoral Fellow Iuna Tsyulneva and Research Assistant Marcus Teo. The project will also feature collaborations with researchers from Japan, Taiwan, South Korea, and the United Kingdom.

This project aims to contribute to Science, Technology and Society (STS) literature by examining the antecedents and consequences of social trust in AI across the East Asian context and beyond.

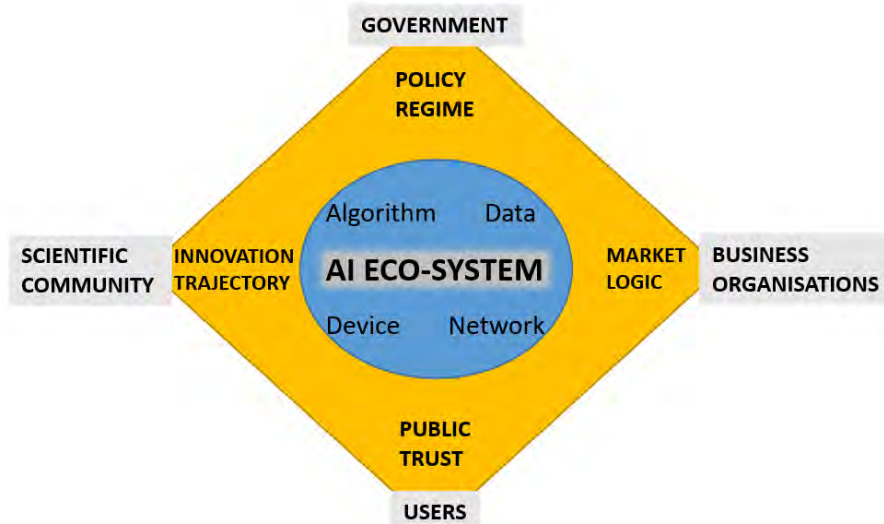


Figure 1. Sociotechnical Landscape of Artificial Intelligence



TEO Tian Leng, Marcus

Marcus Teo is a Research Assistant at NISTH. He is a philosopher by training whose primary interests lie in applied ethics, moral psychology, and philosophy of technology. As an ethicist, Marcus is interested in applying philosophy towards the betterment of his community.

As elucidated in Figure 1, the study will examine the effects of three entities of socio-political significance and their effects on prosumer behaviour in AI: governments, business organisations, and scientific communities. Since this study employs a socio technical framework to understand AI, special attention is paid to public and private institutions and their influence on prosumer trust and usage intentions. By examining AI usage as a consequence of socio-political dynamics and the trust that follows, the researchers hope to uncover new trends in public AI adoption that will generate insights that contribute to the further development of smart cities and responsible, trustworthy AI. Ultimately, then, results of this study will uncover valuable outcomes for AI governance and policy – by shedding light on the antecedents of social trust in AI, policymakers and business organisations can focus their responsible AI efforts on features that matter to the public.

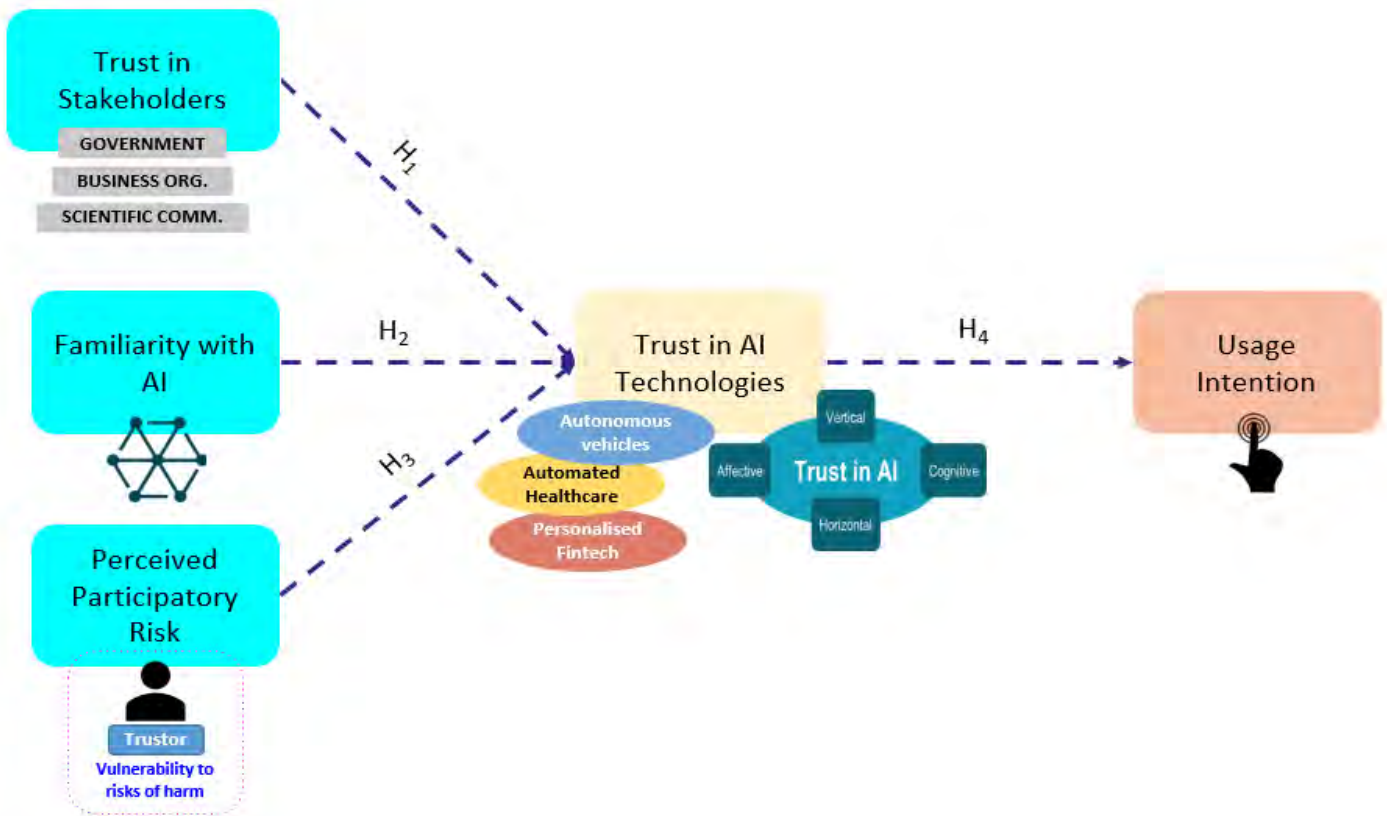


Figure 2. NISTH Model of Intra-Ecosystem Social Trust in AI (MOIST-AI) Model

The project will feature qualitative and quantitative research elements to derive a holistic picture of social trust in AI and has kicked off on schedule. With a novel model of trust developed by NISTH – and subsequently a novel survey instrument for data collection – NISTH is confident in its contribution to the corpus of knowledge in such an important field. Equipped with these tools, NISTH researchers constructed a Model of Intra-Ecosystem Social Trust in AI (MOIST-AI; Figure 2) that serves to summarize the study’s hypotheses:

- H1: Trust in stakeholders is positively correlated with trust in AI technologies
- H2: Familiarity with AI technologies is positively correlated with trust in AI technologies
- H3: Perceived participatory risk is inversely correlated with trust in AI technologies
- H4: Trust in AI technologies is positively correlated with usage intention of AI technologies

NISTH hopes that by undertaking in-house research initiatives, we are able to keep relevant in a fast-paced, ever-changing academic landscape. Indeed, it is within the said landscape that NISTH operates and enables other research bodies to produce high-quality research products. Through such exciting research undertakings, NISTH continues to build and retain international research relationships with prominent academics while simultaneously contributing to their research outputs through the different layers of support NISTH offers.

We look forward to sharing more with you about our research in time to come. Get in touch with us to see how we can support your endeavours!

Exploring Sustainable Urban Transitions and Interdisciplinary Research: A Dialogue with Asst Prof Nurul Amillin Hussain



Nurul Amilin HUSSAIN

Nurul Amillin Hussain is an Assistant Professor at the Department of Sociology at NTU School of Social Sciences.

Amillin is a qualitative researcher and is interested in using a mix of methods, including those that emerge from non-representational theory, in her work. Her research interests include sustainability and smart cities. She did her BA in Sociology at NTU, her MPhil in Anthropology at Cambridge, and her DPhil in Geography at Oxford.

Assistant Professor Nurul Amillin Hussain, an Assistant Professor in the Division of Sociology at NTU, is our newest NISTH Societal Impact Fellow!

She draws her research interest from a unique interdisciplinary scientific background. With a Bachelor of Arts in Sociology, Master of Philosophy in Social Anthropology, and a Doctor of Philosophy in Geography, her work focuses on sustainability, smart cities, and the transition of urban cities to renewable energy. In this engaging dialogue, we dive into her research journey, methodologies, personal insights, and more.

Interviewer: Your research interests include sustainability and smart cities, with a specific focus on the transition of urban cities to renewable energy. How do you draw from your interdisciplinary scientific background? What brought you to this confluence of science directions?

Asst Prof Hussain: *As an undergraduate, I embarked on a URECA project on sustainable discourses, which sparked my initial interest in sustainability. This, combined with my work as a sustainability consultant, exposed me to various projects centered around energy use and renewable energy initiatives. These experiences shaped my specific interest in the transition of urban cities to renewable energy, prompting me to explore interdisciplinary approaches that blend sociology, social anthropology, and geography. The confluence of these disciplines allows me to analyze the social, cultural, and spatial aspects of sustainable urban development.*

Interviewer: Could you please provide more insight into your current research?

Asst Prof Hussain: *Currently, I am involved in two research projects. The first project focuses on exploring the transition to renewable energy in Singapore. We examine policies, technologies, and the societal implications associated with this transition. The second project aims to improve climate change projections, particularly in energy modeling, by incorporating more qualitative parameters. By considering social, cultural, and behavioral aspects, we can enhance the accuracy and effectiveness of climate change projections, contributing to informed decision-making for a sustainable future.*

Interviewer: You mentioned your interest in using a mix of methods, including those that emerge from non-representational theory. Could you elaborate on this approach?

Asst Prof Hussain: *During my PhD fieldwork, I employed a combination of qualitative methods, such as "walk-alongs" and participant drawing sessions, to gather the necessary data. Given that my research often deals with non-human entities, like material objects and things like 'energy', I find it crucial to explore the embodied practices and interactions between humans and non-humans. This focus on enacted and performed practices, rather than mere production, stems from non-representational theory. This method has been employed in various fields, including movement-based practices like dance and walking, helping us understand complex dynamics in our physical environments.*

Interviewer: What research direction are you planning to pursue next?

Asst Prof Hussain: *Currently, I am engaged in ongoing research projects and intend to continue exploring the topics of urban energy transitions and climate*

change projections. However, I am also actively seeking a hobby research topic to pursue in the future, allowing me to further expand my academic interests.

Interviewer: How do you draw inspiration for your research?

Asst Prof Hussain: *I draw inspiration from everyday life.*

Interviewer: What advice would you give to young undergraduates who are about to choose their academic path?

Asst Prof Hussain: *My advice to young undergraduates is to embrace the fact that you will often find yourself as the least knowledgeable person in the room. Learning how to be comfortable with this and being teachable are essential qualities for success in academia.*

Interviewer: How would you evaluate the importance of interdisciplinary collaboration and how has it affected your research?

Asst Prof Hussain: *Interdisciplinary collaboration is vital in academia. Throughout my academic journey, it has played a significant role in shaping my research interests and leading me towards exciting and thought-provoking questions. Collaborating with researchers from different disciplines brings diverse perspectives, expertise, and methodologies to the table, fostering innovative approaches and contributing to a more comprehensive understanding of complex societal issues.*

Interviewer: Apart from your research activities, what is your hobby or passion?

Asst Prof Hussain: *Outside of research, I enjoy reading Harry Potter fanfiction and engaging in various crafts.*

Interviewer: If you were not a researcher, what profession would you have pursued?

Asst Prof Hussain: *If I were better at chemistry, I would have pursued a career as a dermatologist. I've always been interested in skin-related medical and aesthetic treatments. I enjoy visiting different dermatologists when I travel, to see if they employ different methods or use new technologies and tools. It's interesting to see the different kinds of skin issues dermatologists deal with depending on the kind of demographic they serve, in addition to the weather, pollution levels and lifestyle factors found in various cities. Skin trends are also fascinating - there are many culturally significant practices and expectations around skin that can now be supported by increasingly acceptable aesthetic interventions. .*

Interviewer: Could you recommend a book that has had a significant impact on you?

Asst Prof Hussain: *One book that struck me the most is "The Death of Grass" by John Christopher. It was the first post-apocalyptic book I ever read and challenged the notion that fiction is a waste of time. The book, written in 1956, is about a virus that kills grass species and causes famine around the world. It focuses on the struggle of two families in England who must make their way out of the city, amidst rising anarchy, towards an isolated potato farm located in a valley. I re-read the book during the covid period and was surprised by how so much can be accurately predicted through imagination.*

Asst Prof Hussain's interdisciplinary background and research endeavours in the field of sustainability, smart cities, and renewable energy provide valuable insights into the complex challenges of urban transitions. As a researcher, Asst Prof Hussain recognizes that interdisciplinary collaboration is imperative and all future research will need to be all-rounded in its approach. She draws inspiration from everyday life experiences, and with a passion for research, she hopes to contribute to the development of a more sustainable future.

HAPPENINGS:

Past Events

NISTH ThinkOut Podcast Series: Why People Trust Digital Systems



In this inaugural episode of the NISTH ThinkOut Podcast, we met with Prof Lam Kwok Yan. Professor Lam is a renowned Cyber Security researcher and practitioner. He is currently the Associate Vice President (Strategy and Partnerships) and Professor in the School of Computer Science and Engineering, here at NTU. He is the Director of the Strategic Centre for Research in Privacy-Preserving Technologies and Systems (SCRiPTS), and Director of NTU's SPIRIT Smart Nation Research Centre. From August 2020, Professor Lam is also on part-time secondment to the INTERPOL as a Consultant at Cyber and New Technology Innovation. Last but not least, Prof Lam is the Executive Director of the National Centre for Research in Digital Trust (DTC), which is our topic of focus today.

In this casual conversation with Prof Lam, we learnt about digital trust and how it impacts, organisations, consumers, and the economy at large. Prof Lam, shared about his personal foray into cyberspace and great insights into what the future holds. Watch it on our [YouTube](#) channel or listen to it from our [Podcast](#) series.

NISTH Outreach: Meeting with Warren Wilson College

The Warren Wilson College, Asheville, USA, runs a 'Study Abroad class', as part of their Spring Semester curriculum. A 2 week travel portion in the summer, is part of the program, where informal discussions and interactions with universities is included. This year, their conversations focus on the topic of "Gender and Food in Singapore and Indonesia." They chose NISTH, NTU to be their showcase partner. A group of 14 students and 2 co-leaders visited NTU on the 19th of May, as part of their delegation. Assoc Prof Sulfikar Amir, Director of NISTH, gave a short presentation showcasing the expertise at NTU and drawing their attention to the research being carried out at NTU in food science and innovations around it. He also highlighted the diverse and inclusive student and academic faculty here at NTU.

We hope to be able to forge a partnership with the college to hold the 2 week summer program here at NTU annually. With the wide range of academic fields, expertise and facilities made available to them, it is an opportunity to bring NTU to noted institutes, like the Warren Wilson College.



NISTH ThinkOutPodcast Series: Can we control AI?



We have grown overly dependent on the internet, especially with the pandemic, digital communication has become the norm. Also, when the whole world piled onto the Internet in order to do anything during the lockdowns, it stayed up and running which is a huge testament to the foresight of the Internet pioneers in terms of its design and in-built resilience and scalability. But the Internet has never been under such threat and its whole future as a globally interconnected system is in much doubt for many different reasons. This podcast delves into the history of the discovery of the world wide web to the onslaught of AI. The 'new kid on the block', has been given full freedom to explore all spaces, with no governance in place. Since AI systems are designed and developed by humans, they can be programmed and trained with specific rules, algorithms, and data sets to perform certain tasks or

behaviors. So can we control where it ventures into before it is too late?



In the second episode of the NISTH ThinkOut Podcast series, our host, Assoc Prof Sulfikar Amir, Director, NISTH speaks with Dame Wendy Hall, UK's first AI Skills Champion and Regius Professor of Computer Science, University of Southampton, UK. From the discovery of the world wide web to the onset of AI, they discuss the conveniences and disruptions faced. They ask and answer the most daunting question of current times, 'Can we control AI?'. Watch it on our [YouTube](#) channel or listen to it in our [Podcast](#) series.

Job Opportunity: NISTH Postdoctoral Fellow

NISTH is hiring!

We are seeking to appoint a Postdoctoral Fellow to undertake research in the Social Trust of AI project. This is a survey-based study that aims to measure the level of social trust in Artificial Intelligence-based technologies in four East Asian countries, including Singapore, Taiwan, Japan, and South Korea. The study is conducted at NISTH.

The contract is for 1 (one) year with a possible extension for another year.

More details [HERE](#)

NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE | NTU Institute of Science and Technology for Humanity

POSTDOCTORAL FELLOW NEEDED
WE ARE HIRING!
DETAILS ON OUR WEBSITE

WWW.NTU.EDU.SG/NISTH