Scrutinising global human security

*As part of a multi-disciplinary collaborative effort **Dr Takuto Sakamoto** works with a team of experts to use cutting-edge analysis methods for evaluating global efforts on human security and contribute towards research in this complex field*

Dr Takuto Sakamoto *Dr Yohsuke Murase* *Dr Koji Oishi* *Dr Hiroki Takikawa* *Dr Ai Kihara-Hunt*

Your background is in International Relations. Can you talk about how you came to be involved in this research field?

I previously analysed armed conflicts in Africa using computer simulation, but I was at the Swiss Federal Institute of Technology (ETH) in Switzerland for about a year from November 2014 when I first encountered the growing field of 'computational social science'. Among the analytical tools extensively used in this field, I became particularly interested in large-scale text analysis and network analysis. After returning to Japan, I came up with this research theme through a process of trial and error to see if I could use these tools to carry out interesting research. I was also inspired to contribute towards research on human security as part of the University of Tokyo's Graduate Program on Human Security.

Are you collaborating with other researchers through your current work?

It is impossible for me to work on all three sub-projects by myself, so I collaborate with research partners to share the load. Core members of our team include Yohsuke Murase (a researcher at RIKEN), Koji Oishi (a postdoctoral fellow at Aoyama Gakuin University), Associate Professor Hiroki Takikawa (Tohoku University), and Associate Professor Ai Kihara-Hunt (a colleague at the University of Tokyo). Murase and Oishi specialise in statistical physics and are familiar with complex network science. They work on the analysis side of the development assistance network. Takikawa specialises in computational social science and is also familiar with social network theory. He advises on the analysis of aid networks and UNSC meeting records. Kihara-Hunt specialises in international human rights and humanitarian law, and has practical experience as a UN employee, including in the United Nations Office of the High Commissioner for Human Rights (UN-OHCHR) and Peacekeeping Operations (PKO). She has a particular interest in issues relating to sexual exploitation and abuse (SEA) and focuses on collecting and analysing data in this area. We also expect that she will play a major role in discussing the practical and policy implications of the overall project. The graduate students at the University have also made significant contributions as research assistants on the project.

What type of progress have you made so far with this research?

We are still at an early stage in the project and don't have significant findings that we can share yet. As regards to UNSC research, however, the text analysis of meeting records is progressing well and it has become clear that there is a non-trivial pattern relating to the awareness of the 'threats' facing the international community among the major powers that make up the Security Council. For example, Russia's perception of threats is closer to Western countries, such as the United States, Britain and France, than to China. These results have been summarised in a paper, but the analysis on this is still in the exploratory stage. In the other sub-projects, we have almost finished collecting relevant data such as global aid flows. We are now beginning preliminary analyses on these data. ●

Computer analysis of human security

| Researchers in Japan are using cutting-edge data and network science analysis methods to break down and evaluate current global human security efforts

Human security is a global concern relating to the protection and expansion of fundamental human freedoms. Focus on survival, dignity and the ability to maintain a livelihood must be central to the integrated policies that are vital to protecting human security. Many interconnecting issues form part of human security and range from topics surrounding the protection of people from poverty, violence, instability as well as tackling lack of education, healthcare and financial stability.

Dr Takuto Sakamoto is part of the University of Tokyo's Graduate School of Arts and Sciences Human Security Program (HSP) and has taken the approach of using cutting-edge analysis methods from data and network sciences to scrutinise and evaluate global efforts relating to human security. 'Although the term human security itself is relatively new, the importance of the various issues covered there (conflict and humanitarian crisis, poverty and hunger, infectious diseases, immigrants and refugees, etc.) have been recognised by the international community for a long time,' he says.

HIGHLY EXPERIENCED TEAM

Sakamoto leads a team comprising experts from fields as diverse as data science, statistical physics, computational social science, area studies and developmental economics to tackle three key areas within human security. His team members include former United Nations staff who bring not only academic expertise, but also experience working within a global organisation concerned with human rights and freedoms issues. Sakamoto and his team are seeking to shed light on existing global approaches

to human security issues as well as hoping to contribute towards policy making and the development of practical strategies for tackling human security breaches. 'There is a lack of systematic information and appreciation for global human security efforts,' states Sakamoto. 'While a significant body of research exists in the field of human security, much of this is made up of individual case studies and comparative studies that comprise a small number of cases.' This has meant that existing knowledge in this area is fragmented.

The team's focus is on building and filling in the gaps in existing knowledge on human security. They aim to achieve this by collating and analysing large volumes of data to create a systematic knowledge base. By working across a number of disciplines, they hope to evaluate existing efforts at addressing human security issues. 'We would like to evaluate the effectiveness of the current efforts by the international community and link them to policy proposals to make these efforts more effective,' highlights Sakamoto.

TAKING A CLOSER LOOK

The team is currently focused on three sub-projects. The first of these centres on the analysis of policy discussions held by the UN Security Council (UNSC). In this, they will look in detail at the meeting records for the UNSC over the past decades. The second project uses development assistance flow data to complete a network analysis. 'To systematically clarify the dynamics of global collaboration in various areas, including poverty reduction and infectious disease control, we will work on visualising and analysing the financial flow of humanitarian and development assistance

over the last 60 years,' explains Sakamoto. The final pilot study investigates sexual exploitation and abuse (SEA) in UN peace operations. This has become a major issue relating to UN peacekeeping operations in conflict and post-conflict areas in recent years. 'Information in this area is being collected from various data sources such as media and NGO reports as the data released by the UN has proven insufficient for detailed analysis,' observes Sakamoto.

THE DATA CHALLENGE

Dealing with large quantities of data has not been without its challenges. Acquiring large amounts of meeting records from the UN website, then extracting and processing the text prior to analysis has proven to be an obstacle to the team's analysis work. 'Although, at just over 40 million words in total, the record does not represent an exhaustively large quantity of text for analysis by global standards, the challenge remains to efficiently process the text for analysis,' points out Sakamoto. He has been writing a computer program to carry out these tasks automatically, but this job has often been difficult. 'The structure of the UN website for obtaining meeting records and the document format of the meeting records are complicated or inconsistent, so it is necessary to write the program in a form that assumes various exceptions and irregularities,' he says.

The program must also encode for a series of procedures, including extraction and acquisition of text, pre-processing, then machine learning-led analysis and output processing. However, writing the programme itself remains the major hurdle. 'Once the ▶

program is written, the subsequent processing may take some time depending on the performance of the communication network and computer, but most of it is automated, so it does not take much effort,' comments Sakamoto.

BENEFITS AND IMPACT
The three sub-projects are geared towards extending the existing knowledge base on human security through extensive data analysis. Sakamoto hopes that this will equip policy makers and other key international actors to collectively respond to new and existing threats to human security. He believes that this will facilitate an objective viewpoint for evaluating how and where improvements have been made and what yet needs working on. 'The beneficiaries of such research are not only the academic researchers involved in international

through systematic data analysis in the project. It will make the potential and limits of the international community for addressing these problems clearer, which I think is very significant,' Sakamoto comments. 'I hope that our research will lead to further expansion in related fields and in academic and practical application of cutting-edge methods utilising computers such as network science and large-scale text analysis,' he adds.

FULL-SCALE ANALYSIS
Looking forward, Sakamoto and his colleagues will conduct a full-scale analysis of the UNSC meeting records. 'This will systematically reveal the possibility of sharing awareness and norms among major countries regarding the response in the context of conflicts and humanitarian crises, by also including other relevant documents such as the meeting records of the UN General Assembly,' he

many benefits not just to policy makers and practitioners but to the world at large as the insights he hopes to uncover through the systematic organisation and analysis of data can help shape and guide strategy and action on human security issues. ●

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relations and human security studies, but also the policy makers and practitioners of public and private organisations such as governments, international organisations, NGOs and companies involved in these issues,' explains Sakamoto. One goal of the work is to provide guidance for policy makers and practitioners in their work. He is also eager to communicate his findings not only to policy makers and fellow researchers but also to the general public. 'I want to deal with the various problems that the world is facing today, including the issue of human security,

outlines. Regarding the sub-project on development assistance flows, his team is now focused on revealing evolving patterns of global collaboration networks. Finally, in addition to their current task of collecting and organising data on SEA in UN peace operations, they also hope to build a database with this data as well as information from regional organisation operations.
However, with funding for the project due to end in March 2022, Sakamoto's work faces the ultimate challenge of battling against time constraints. His ambitious targets promise

Conceptual map regarding threat perception derived from UNSC policy deliberations