digitainable
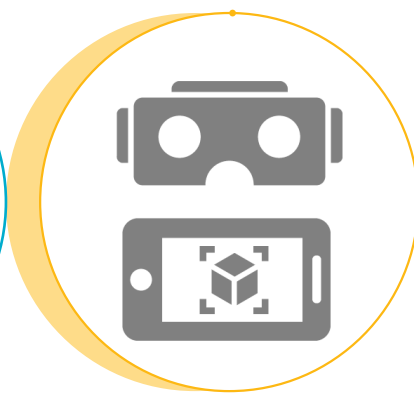## Forum

Session Booklet

Content

Session 1: Digitalization and Artificial Intelligence for People

1.1 One Health and Digitalization

Speaker: Dr. Timo Falkenberg

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Health is a central pillar of sustainable development and is thus prominent in the SDGs. Not only does "Good health and Wellbeing" form SDG 3, but health is synergetic with many other SDGs. The One Health approach is an integrative approach that recognizes the intricate interconnections between human, animal, and environmental health, and as such, requires actions across multiple sectors, including health, water, food, environmental and agricultural sectors. The intersectoral collaborations required for One Health urge for new information and communication structures that digital technologies and applications can facilitate. While digitalization offers the potential to induce improvements in the performance of each subsector, inducing, for example, better outcomes and facilitating access to health care, clean water, and adequate food for vulnerable groups, digital tools can also be used to integrate data from multiple sectors to monitor, predict and coordinate a variety of health-related phenomena. Digital integration of critical control points, water supply, and the food chain, along with disease incidence, environmental variables, and land-use change information, could be used to monitor and predict disease outbreaks or act as a decision-support tool. Even though digitalization holds promises for sustainable development in low-, middle- and high-income countries alike, respective needs or the applicability of technologies in different countries differ and the various resource restrictions need to be considered. The opportunities and challenges for One Health Digitalization will be discussed.

1.2 Towards achieving SDG 2: The potential of D&AI to build supply side capacities in the African food and agriculture sector

The world is not on track to end hunger and malnutrition by 2030 in line with Sustainable Development Goal 2 (SDG2). The number of hungry people has been rising again, from 653 million in 2015 to 690 million in 2019. An estimated 3 billion people could not afford healthy diets. Africa has the highest prevalence of undernourishment, estimated at 19 percent for 2019 (FAO et al., 2020). The reasons for these developments are diverse and complex. While conflicts and weather-related shocks have contributed significantly to the recent increases, systemic constraints to the production and distribution of sufficient and healthy foods continue to hamper progress. D&AI can contribute to addressing some of these gaps. Among promising areas of application, D&AI technologies can help to build productive capacities, e.g. through better access to information, input markets and financial services, including among small-scale producers, and improve the functioning of supply chains to facilitate the distribution of food. While many D&AI solutions for small-scale producers exist across Africa, their reach is limited and geographical spread uneven. A review of 390 such services shows that just 15 solutions exceed the one million-user mark, and most users and service providers are located in East Africa (Tsan et al., 2019). The recent trend to bundle different types of services and offer them via digital platforms has the potential to increase the reach and transformative power of D&AI technologies in African food and agriculture. This trend is supported by the growing adoption of emerging digital technologies beyond the mobile phone. Among the most promising technologies are devices to collect large amounts of data on the ground or remotely through satellites, combined with AI-enabled systems for data analysis to inform decision-making. Blockchains promise to revolutionize

record keeping, product tracing, and contracting. In the longer term, the use of D&AI technologies to automate operations in agricultural production and food processing could improve productivity, efficiencies and ensure better and more consistent quality. To increase uptake of D&AI technologies in African food and agriculture, large-scale investments in infrastructure for mobile connectivity across the continent are urgently needed to expand the reach of networks and improve network speed, reliability, and affordability. In addition, the innovation environment for local D&AI services providers needs to be enhanced, e.g. by expanding innovation hubs and improving access to mid-level finance. Particular attention should be paid to incentivising and supporting local companies also to generate employment for the tech-savvy African youth. Human capacities need to be strengthened among service providers through dedicated higher-education courses, as well as among end-users by integrating related training into school, vocational training, and university curricula. Importantly, D&AI technologies need to be embedded in broader agricultural and rural development strategies to improve the overall context in which these solutions are provided, thereby enabling users to take advantage of the functions being provided.

Speaker: Dr. Heike Baumüller

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1.3 A new Trust mechanism empowering refugees' employability and access to education

Speaker: Laura Degiovanni

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According to the UNHCR, each year 26 million human beings are recognized as refugees and more than 80 million people seek asylum protection worldwide. About half of these people are children and teenagers in need of education. Despite the programs to help refugees integrate into the hosting country, only a minority of them reach economic and social inclusion. Their difficulties to efficiently demonstrate their identity, skills and competencies trigger xenophobic attitudes and cause refugee exclusion from the labour market. In countries like Colombia, 60% of refugees are out of work, in Turkey, only 3% of employed adults take part informal labour market. Where does prejudice start? Do law and humanitarian support shape an inclusive culture or is the other way round? Prejudice has a dangerous outcome in any context. However, when entire groups of individuals within a society have little chance to reverse their stigma, it can quickly drive to societal divides and economic slowdown. Developing countries hosting millions of refugees like Colombia, are examples of how a quasi-total lack of facts objectively reported, a high level of false documentation, diffuse bribery and less structured processes exponentially contribute to foster xenophobia against refugees. We will be sharing our findings of the mechanism that generates trust between people, which is the prerequisite to have credit within any society, and how governments, the education system and humanitarian organizations are called to contribute to empowering refugees with immutable proofs

of their trustworthiness. We will be discussing how we leverage tamper-proof blockchain-based credentials stored into a shareable digital portfolio combined with a unique algorithm, assigning a value to sets of credentials' trustworthiness with the aim to facilitate Colombian employers' objective decision-making, fight prejudice, help digital matching of jobs based on corroborated claims, and enhance the efficacy measurement of settlement schemes.

1.4 Big data to tackle sustainability social indicators and beyond

Speaker: Dr. Ingmar Weber

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The Faustian bargain that underlies most of the internet economy works as follows: social media users provide platforms such as Facebook, LinkedIn, or Snapchat, with large amounts of personal data and, in return, these platforms provide the users with free access to their services. The social media platforms then store and enrich the user data to offer advanced targeting capabilities to advertisers. For example, Facebook provides the possibility to selectively show an advertisement only to women, aged 25-34 who are currently living in Colombia, who used to live in Venezuela, who are self-declared university graduates, and who use an Apple iPhone to access Facebook -- a degree of targeting not possible through traditional advertising channels.

To facilitate budget planning of such targeted advertising campaigns, Facebook and other platforms provide advertisers with so-called "audience estimates" on how many of their users match the selected targeting criteria. These estimates are provided before launching an advertising campaign and hence before any cost is incurred. Knowing whether the target

audience comprises 100k or only 1000 users has clear budget implications. In the example above, Facebook estimates that there are 4100 users matching all of the criteria (as of Dec 24, 2020). These publicly accessible, anonymous user estimates are created to support profit maximization. However, as a by-product, they provide a digital real-time global census of social media users that can be used to monitor global development. For example, insights into how many women vs. men use a particular online platform or how many of them have expressed interest in particular topics, shed light on digital gender gaps. Similarly, knowing who does and who does not use expensive devices to connect to online services provides a strong signal for wealth inequalities. Finally, information about temporal and spatial variation in the number of users living outside their home country helps to understand migration phenomena. In our research, we show how audience estimates derived from noisy social media data, can be used to (i) track digital gender gaps, (ii) map poverty, and (iii) monitor international migration. A key challenge in this work is how to address questions of data bias, either through models that help "re-calibrate" the data, or through focusing on relative trends rather than absolute values. In particular, I'll discuss how the lack of particular users on these platforms provides as strong a signal as the presence of others. The presentation draws from a number of collaborations with UN agencies and international NGOs.

Session 2: Digitalization and Artificial Intelligence for Planet

2.1 Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early-warning

Speaker: Niyanta Shetye

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Climate change education, training, awareness, access to information, and participation have always been a challenge. The first attempts date back to 1992 and have trickled down from 1972's Stockholm Declaration; however, today's approaches need to evolve to accommodate the innovations made in digitalisation, more specifically on Information and Communication Technologies (ICTs). As countries inch towards implementing the Paris Agreement, it is necessary to observe where the minor article in the agreement on these key-elements lies with regards to ambition and implementation. Are countries and UN organisations factoring in rapid and uneven digital transformation and developments such as e-learning platforms, 5g, data costs, misinformation, and digital divides during their annual climate conferences? Are the current mechanisms under the UNFCCC equipped to discuss SDG13.3.1 while considering these new developments? Moreover, has the climate change regime ignored the fact that internet access will play a role in implementing this article and SDG 13.3.1, especially in the COVID era? By analysing NDCs submissions, submissions by state and non-state actors in the UNFCCC, and by studying decisions taken to enhance the work under this article, we try to determine if this current platforms under the UNFCCC are sufficient to tackle digital divides and misinformation for the implementation of this article and SDG 13.3.1. Furthermore, our research also provides solutions and recommendations which can improve the UN platforms to make them more relevant to the fast-changing digital landscape.

2.2 How big data and mobile internet technologies assist to build resilience in the context of climate change and its impacts?

The Caribbean and the South Pacific are well-known tourist destinations, but life is not always a paradise for local communities. According to the World Risk Report, small island states in both regions are some of the most vulnerable in the world to climate and geo-risks. The 2020 hurricane season in the Caribbean was the most active on record, with thirty total named storms. In the Pacific, Fiji, Solomon Islands, Tonga, and Vanuatu were devastated by Tropical Cyclone (TC) Harold in early April 2020, impacting more than 160,000 people and damaging up to 90% of buildings on affected islands just as COVID- 19 travel restrictions were being implemented. Most recently, Fiji experienced the Category 5 TC Yasa, which caused damages in excess of US$250 million. This high exposure to natural hazards—including tropical cyclones, droughts, floods, tsunamis, earthquakes, and volcanic eruptions—in combination with small islands' vulnerability to economic shocks and slow or stagnant economic growth makes building resilience a formidable challenge for organizations, businesses, and individuals. Despite their high exposure to natural hazards, most people in this region do not have any financial protection, such as insurance. Digitalization and big data are helping to close this risk finance coverage gap. Big Data for Climate Adaptation In support of SDGs 13 and 17, the Munich Climate Insurance Initiative (MCII) and their partners have successfully implemented parametric insurance products in the Caribbean using remote sensed data as part of the Climate Risk Adaptation and Insurance in the Caribbean (CRAIC) project. These products protect clients from the extreme wind and rainfall that often accompany tropical storms by automatically triggering insurance payouts when wind or rainfall triggers are surpassed, according to satellite data.

Through the recently-launched Pacific Insurance and Climate Adaptation Programme (PICAP), MCII and its partners are building on lessons from the Caribbean to develop parametric financial solutions to help households, communities, and governments in the Pacific manage their natural hazard risk. Mobile Internet Technologies to Increase Access An important component of the PICAP programme is leveraging mobile internet technologies to increase access to financial services in the Pacific broadly and to risk financing specifically. These works support SDGs 1, 5, and 8. The programme plans to develop risk financing solutions, such as insurance, that can be purchased online and also paid out to clients' mobile wallets. The CRAIC project began in 2011, and while mobile technologies were not explicitly used, once an insurance payout is triggered, claims are automatically sent to clients' bank accounts. This system allows clients to receive their insurance payouts within seven days of a triggered event, providing immediate liquidity directly to customers in their time of need.

Speaker: Shaily Vyas

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2.3 Smart contracts and blockchain technology as a novel method for agro products certification

Speaker: Dr. Ricardo Borges dos Santos

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Much of the world's chocolate supply relies on more than 1 million child workers. Despite cocoa industry promises to eradicate the practice, child labor is on the rise," reports Peter Whoriskey on the Washington Post among several other reporters. Consumer awareness alongside trusted information access through mobile devices and third-party certification can help block this. This paper presents smart contracts and blockchain technology as a novel method for agro products certification. The method allows for a specific crop to be uniquely identified and the yield be followed along the chain to consumers. It implements true verifiable third-party certification (TPC), thus avoiding greenwashing and quantitative fraud (i.e. double-spending of more valuable crop vintage), providing economic incentive along with the stakeholders of the supply chain. A comprehensive explanation and analysis of the functionalities of blockchain, as well as the underlying smart contracts and distributed ledger technology, follows. Smart contracts using tokens are proposed to avoid counterfeit and spur more trust in the supply chain participants. A proof of concept using the Ethereum IGR token is evaluated. The main findings include: a) Distributed Ledger Technology using smart token contracts showed that TPC from any desired authority and certifying social or environmental properties is economically feasible. b) Food safety can be enhanced, reducing counterfeiting. c) The built-in economic incentives leverage practical usage of the

framework for all chain actors. In summary, this implementation of TPC for any number of pseudo-anonymous previously unknown actors can improve sustainable and trustworthy supply chain management. The main research limitation points to stakeholders' reduced practical knowledge of smart contracts, thus the need for the development of user-friendly, front-end programs to allow for facilitating usage. The practical implication of the framework is to significantly enhance trust along the supply chain, allowing consumers to check for the TPC via their mobile devices easily. The possibility of differentiating a harvest from a commodity product embraces a powerful incentive mechanism. The impact of TPC of the harvest to the food industry can not be underestimated and can be compared to the enormous positive impact of the ISO 9001 quality TPC to industrial and service quality in the last two decades."

2.4 Digital Surveillance: A viable solution for tackling the climate crisis?

The digital age presents both opportunities and risks in its capacities to tackle the climate crisis. For example, machine learning can help to forecast electricity supply and demand, enabling better management of variable renewable energy sources such as wind and solar power (Rolnick et al., 2019). Advances in earth observation and the Internet of Things also have great potential to enhance data collection and monitoring (Hsu et al., 2020). But risks associated with misinformation and disinformation, algorithmic bias, and issues of privacy and cybersecurity among many others cannot be overlooked (Corbett-Davies et al., 2017; Lazer et al. 2018; Luers et al., 2020).

In this presentation, I will explore perspectives on the use of one particular digital tool to tackle the climate crisis: digital surveillance. By digital surveillance, I refer here to the collection of personal and aggregate data from Internet-based sources, cellular and wearable devices, social media, as well as video surveillance and facial recognition software (following Aiello et al., 2020; Ramos, 2020). I will begin by presenting the results from a multi-phase survey conducted in the spring, summer, and autumn of 2020. The key finding to emerge was consistent, high levels of support amongst respondents for the use of digital surveillance to tackle the climate crisis. On average, across all three phases of the survey, 77% of respondents were not opposed to the use of digital surveillance to tackle the climate crisis (where all respondents who answered 'neutral', 'supportive' or 'strongly supportive' on a five-point Likert scale are considered here to be 'not opposed'). There were, however, marked regional differences in perspectives. In particular, respondents in Europe and North America were less supportive of these measures, while those in Asia, Central America, MENA, South America, and Sub-Saharan Africa were more supportive. I will then link these findings to insights gathered from expert respondents from the global sustainability science community on priority actions needed to manage the digital transformation underway to support the development of a more resilient, sustainable, and equitable society. These include (1) protecting privacy & human rights, (2) mitigating the Digital Divide, and (3) ensuring transparency and accountability across multiple stakeholder groups. I conclude by discussing the implications of the findings on the development of frameworks to govern the deployment of digital tools such as digital surveillance to tackle the climate crisis.

Speaker: Dr. Jennifer Garard

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WORKSHOP FORMAT
Session 3: Digitalization and Artificial intelligence for Partnership

3.1 Global Citizenship and Digital Training Formats: Experiences of the MGG Academy

Digitalization, as an accelerator of communication and globalization, has the power to both unify and divide. The sense of community is a key enabler of inter- and transnational cooperation to address global challenges (Messner et al 2016), as enshrined in the UN 2030 agenda for sustainable development. Under what conditions can such a feeling and the idea of global citizenship be facilitated in the digital sphere towards the achievement of the Sustainable Development Goals (SDG)? The proposed session of the 'digitainable forum 2021' is designed to addresses this question with a particular focus on transnational online training and learning. They are understood as promising instruments to utilize digitalization towards the implementation of the 2030 agenda if dialogue concepts and peer-learning environments facilitate the development of community via an exchange on global challenges and solutions. The session takes the form of a workshop that combines expert input and interactive breakout group discussions with the illustrative application of digital learning tools. It builds on the lessons of the Managing Global Governance (MGG) Academy, which was forced by the COVID 19 pandemic into a digital edition in 2020 after more than a decade of physical formats, as well as further experiences from MGG partner institutions. The findings will feed into the development of a transnational open-access training concept under the framework of the EU Horizon2020 project PRODIGEES, which aims to promote research and network development on digitalization towards sustainable development in emerging powers and Europe. Following the design and invited participants of the session, the workshop fuses a focus of SDGs 4 and 17 by means of transnational learning through digit-alization. It relates to SDG 17 as it evokes the importance of partnerships in inter- and transnational cooperation, including North-South and technological cooperation. At the same time, it speaks to partnerships that can further the targets of SDG 4, Quality Education for All, specifically target 4.7's promotion of sustainable development through global citizenship to empower the narrative of unity, of mutual vision, and of working towards a global common good.

Speaker: Dr. Tatjana Reiber

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This Workshop has been organzied in the framework of the MGG Academy and the project PRODIGEES.

Session 4: Digitalization and Artificial Intelligence for Prosperity

4.1 Should we put a value on nature's assets? Using next generation digital market mechanisms to solve the problem of the tragedy of the commons

Speaker: Katrina Donaghy

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For those who know or have ever read about the tragedy of the commons made popular by American ecologist Garret Hardin in 1968, you would be hard pressed not to agree that years of uncoordinated action over the governance and access to our planet's shared resources has resulted in acts of individual self-interest in defiance of a common good for all others – overconsumption, underinvestment, and depletion of nature's assets. In an ever-increasing digital era, we now have new technology tools to help redesign and transform our economic and social institutions whereby rethinking governance and consensus through the lens of transparency, accountability, and trust – enabling nature's assets to be valued or even priced. Just like carbon markets being the first ESG assets for trading credits to offset pollution, such new technologies are revolutionising access to traditional natural capital markets by creating clearer pathways between buyer and sellers and unlocking the value that has been stored siloed and legacy systems – never to be scrutinised, measured, or shared. For some, the idea of putting a price on nature is difficult to accept especially nature's most precious asset: Water! However, what if we could use next generation digital market mechanisms to solve the problem of the tragedy of the commons?

4.2 Assessment of emerging sustainability-oriented technologies

Note: The presentation details cannot be published as the presented work is under review at a scientific outlet. Thus, we only publish the name, email, photo of the presenter and the title of his presentation.

Speaker: Dr. Michael Wustmans

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4.3 Synergies and conflicts between SDGs: The chances and risks of digitalization, AI, and big data for sustainable land use

Today digital technologies and data are available on an unprecedented scale. This provides chances as well as risks for sustainable development, in particular in terms of synergies and conflicts between SDGs in the context of land use. Remote sensing, citizen science, and social media are just some examples of emerging data sources, which provide valuable information to predict and resolve emerging challenges. In this presentation, I will take you on a conceptual journey looking at how new digital technologies can support decision-makers in designing coherent land-use policies, help farmers in making smart land-use decisions, reducing the ecological footprints of markets, and supporting scientists in generating and synthesizing relevant inter- and transdisciplinary knowledge. I will take a look at the past, and the impact of technologies on sustainable development and use examples from ongoing and envisioned research projects to show how and under which conditions the

same technologies could have a positive impact on reaching the SDG.

Speaker: Jun.-Prof. Dr. Lisa Biber-Freudenberger

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4.4 The mutual potential of artificial intelli-gence (AI) and sustainable development (SD)

My talk will show the mutual potential of Artificial intelligence (AI) and sustainable development. Focusing on SDG 16, I will show the potential but also the pitfalls of AI and sustainable development. I will link my presentation to specific technical applications or demonstrators that give insights into the interrelationship of AI and sustainable development. AI impacts society and our lives. Nevertheless, there are very different ways to frame it. AI poses ethical, political, societal, organizational and economic questions. Scholars, politicians and other observers often use one of the frames to support or criticise AI. Fewer observers engage in the discussion of what the right frame should be and why we choose a specific frame. Therefore, my looks into the potential of sustainable development as a frame for AI (Djeffal 2019b). Sustainable development is a framework that gains attention in discussions surrounding AI, despite the fact that there is a huge potential to consider the transformative potential of digitisation and calls for a transformation for a sustainable future. Therefore, I propose to aggregate different views about pursuing sustainability goals or designing digital technology in a

sustainable way and to establish sustainable development as a frame for artificial intelligence. This allows to incorporate many learnings that have been made in the discourses surrounding sustainable development, but also to update these discourses and to include new learnings from the field of artificial intelligence. Another advantage is that the discourse around sustainable development is inclusive and pluralist while having an international range. Sustainable development also allows to analyse technology on different layers. On the technical layer, specific questions regarding the technology can be analysed. The social layer analyses the socio-technical surroundings of the technology that can be as important. Yet, SD also looks at technological issues from a macro-perspective analysing the governance of the technology as a whole. The sustainable development goals have a double function. They are goals that should be supported by new technologies such as AI. They also give guidance on how AI should be developed generally and where developers should be careful. AI and access to justice are apt reflections of the aforementioned. The chatbot DoNotPay shows how technology can be used to give people access to justice. A simple chatbot allows people to formulate letters that they can send to public administration or to court. This system proliferated over a short period of time and now grants access in vastly different regards. The Australian Authorities used the online compliance intervention to collect debts from social benefits. In order to collect more debts, they turned an assistance system into a fully automated system. The burden to correct data was shifted from civil servants in public administration to citizens receiving social benefits. After several problems, two inquiries highlighted different issues with the system. Many of those remarks are hints of how to increase access to justice when drawing up a fully automated legal application. An analysis structured by the different layers of SAID showed that many aspects have to be taken

into consideration. These range from modeling the impacts of certain decisions and from providing for enough information on how to challenge the decision and whom to ask for information to general governance questions about the organisation of public administration. This example also shows that access justice in the system of public administration has many faces. On the one hand, there is taxpayers' justice and the need for all people to pay taxes according to the same rules and not to receive unjustified benefits. But there is also access to justice when debts are reclaimed, and citizens challenge them. As in so many cases, justice is only achieved if there is an equilibrium of several views and needs. The concept of sustainable development explicitly addresses the question of how to find such an equilibrium and convergence in the face of conflicts and opposing needs. This might be one aspect, while sustainable AI development might turn out to be a frame that is useful for the analysis of AI.

Speaker: Prof. Dr. Christian Djeffal

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WORKSHOP FORMAT
Session 5: Digitalization and Artificial Intelligence for Peace

5.1 The role of digital solutions in peace-building

The role of digital technology in building peace and supporting humanitarian response has been rapidly expanding since the late 2000s and will play a key role in achieving the targets in SDG 16. While there are many examples of success using digital technology in peace and humanitarian response, there is still a robust need for identifying new research directions and bringing together lessons learned from successful project implementations. To achieve the targets in SDG 16, future applied research needs to be based on experiences from practice, bringing together the best aspects of both engineering and social science. With this in mind, the panel will bring together experts from academia and NGOs to discuss what leads to successful digital peace-building and humanitarianism and identify the richest directions for new research on digitalization to support SDG 16. John Green Otunga will provide insights from his years of experience as East Africa Programme Manager for the Sentinel Project, where he leads grassroots level digital and media peace-building projects in Kenya and South Sudan. To explore the way that global networks of digital peacebuilders work together and share experiences, GPPi's Claudia Meier will present on the state of digitalization in humanitarian response and how organizations like Build Up bring together knowledge from the grassroots to the international level. Ziad Al Achkar, a doctoral candidate at George Mason University's Carter School for Peace and Conflict Resolution, will discuss his work and where he sees new opportunities for research on digitalization in support of SDG 16. The panel will be moderated by Charles Martin-Shields, a Senior Researcher at the German Development Institute. By bringing together experts from

different practice and research streams, the panel will explore how new technologies like AI and machine learning can influence social cohesion and peace processes while also discussing the ongoing importance of technologies like radio to reach communities in regions with limited digital connectivity. An inclusive research agenda that includes social science, engineering and lessons learned from practice can lead to digital solutions that support peace, social inclusion, and the wider aims of SDG 16.

Speakers

John Green Otunga: The Sentinel Project; Nairobi, Kenya

Ziad Al Achkar: Carter School for Peace and Conflict Resolution, George Mason Univeristy; Arlington, VA, USA

Althea Middleton-Detzner: PeaceTech Lab; Washington, D.C., USA

Main Speaker: Dr. Charles Martin-Shields

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