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SOCS Spotlight Abstract Proceedings

Spotlight Programme

16:30	*Des Cartes: Intelligent Modelling for Decision making in Critical Urban Systems* **Flora Luciani** Programme Officer, CNRS@CREATE	13
16:40	*Awe in Public Life* **Louise Vogel Kielgast** Director, GEHL	14
16:50	*Future-Positive Cities* **Thomas Schroepfer** Professor, SUTD and Director, Singapore-ETH Centre Future Cities Laboratory Global	15

Housing Context, Urban Form, and Park Design in Shaping Urban Park Visitation: Mobile Big Data Evidence from Singapore

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Urban parks are distinct because they are publicly accessible, support multiple activities, and are shared by residents from both public and private housing. Understanding differences in urban park visitation and use across housing contexts is essential for planning green spaces that promote inclusive and sustainable cities, as articulated in Sustainable Development Goal 11. Singapore has a state-led housing system in which public housing plays a central role in structuring the green space system. Yet how people from different neighbourhoods, shaped by diverse environmental conditions and implicated socioeconomic backgrounds, use urban parks remains insufficiently understood. This study examines how neighbourhood spatial configuration, housing type, and park characteristics shape park visitation, and how these relationships relate to broader goals of inclusive access to urban green space and sustainable urban development. We adopt an evidence-based approach that bridges planning and design theory with observed human behaviour by combining land use and planning data, green and blue infrastructure metrics, street-level imagery, and anonymised mobile phone data. The analytical framework distinguishes between inter-park and intra-park layers to examine both access to parks and movement within them. Drawing on evidence from three urban parks in Singapore, Jurong Lake Gardens, Bishan Ang Mo Kio Park, and Punggol Waterway Park, spatiotemporal analysis shows that visitation patterns vary with visitors' housing context and their accessibility to parks. In addition, through spatial regression analysis, key features influencing intra-park movement and use are identified including both objective environmental attributes and subjective experiential indicators. Overall, the findings demonstrate that park use is closely tied to the housing system and surrounding neighbourhood structure. By providing empirical evidence on social inclusion through spatial and mobility analyses, this study underscores the value of an interdisciplinary approach and offers planning insights for integrating park design and neighbourhood planning to advance more inclusive and effective public spaces.

Keywords: Housing Context, Neighbourhood Configuration, Urban Parks, Visitation Pattern

Bayi Li is an urban data science researcher at the Lee Kuan Yew Centre for Innovative Cities, Singapore University of Technology and Design. Trained across urban planning and geographical information science, his work integrates spatial analytics, machine learning, computer vision, and urban theory to examine mobility, public space, and environmental exposure in contemporary cities. His research seeks to translate complex urban data into actionable insights for policy, planning, design, and sustainable urban development.

Mind the Gap: Bridging the Divide Between AI Potential and Operational Reality in Urban Governance

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Artificial Intelligence (AI) has become central to contemporary smart city visions, promising real-time adaptive mobility systems, predictive infrastructure maintenance, and data-driven urban governance. More recently, cities have begun positioning AI as an enabler of regenerative urbanism — utilizing data to support climate adaptation and long-term urban resilience. However, a significant divergence exists between theoretical capabilities ("What can be done") and the operational realities of governments ("What is actually done"). While algorithms grow increasingly sophisticated, their integration into binding urban policy and daily workflow remains sporadic, often stalling in the initial stages of what we term "pilot purgatory". This paper investigates the structural and governance implementation barriers that prevent AI technologies from scaling beyond the literature into permanent urban planning tools. Through a comparative analysis of recent initiatives in globally recognized smart city testbeds, this research contrasts the technical specifications of proposed AI models against the regulatory and administrative frameworks available to sustain them in practice. Our findings show that the primary obstacles to AI adoption for urban planning are not technological limitations, but institutional constraints. These include fragmented data governance, procurement rigidities, and a misalignment between dynamic algorithms and static statutory planning processes. Critically, these administrative constraints impede the deployment of urgent climate-responsive interventions. Building on these insights, we propose an "Operational AI Readiness" framework that provides policymakers with a practical roadmap for embedding AI into regenerative urban governance — aligning administrative workflows, regulatory mechanisms, and organizational capacity with emerging algorithmic capabilities. The paper offers actionable guidance for cities seeking to move beyond pilot projects toward durable, accountable, and scalable AI-enabled planning systems that support long-term urban regeneration.

Keywords: Urban Governance, Implementation Gap, Regenerative Urbanism, Urban Artificial Intelligence, Data-Driven Urbanism, Smart City Implementation

Kloe Ng is a researcher and educator at the National University of Singapore (NUS), where she is also currently a PhD student. Her work operates at the intersection of urban planning, artificial intelligence, and behavioral economics. Kloe's professional background spans international policy, industry and research, including previous roles at The World Bank Group and Surbana Jurong. She received her Master's degree from the Massachusetts Institute of Technology.

Advancing Early Design-Stage Carbon Awareness: A Building Envelope Workflow for Net-Zero Cities

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Achieving net-zero whole-life carbon emissions remains a critical challenge for the built environment, particularly as cities advance toward 2050 carbon neutrality targets. This requires early-stage design approaches that consider both operational and embodied impacts. Advances in simulation tools have enabled performance analysis during initial design phases of buildings, particularly for operational energy. More recently, parametric modelling has allowed these evaluations to be embedded within iterative workflows, connecting material choices with environmental outcomes. This integration supports more comprehensive early design exploration, where both operational energy and embodied carbon are assessed in tandem to guide low-carbon design decisions for urban environment. However, embodied carbon analysis continues to lag behind. Life cycle assessment methods are often constrained by limited data availability and remain difficult to apply during early design stages, creating a significant barrier to achieving net-zero design ambitions. This study answering those challenges by proposing a workflow focused on the building envelope to enable fast and reliable estimation of both embodied carbon and operational carbon during early-stage design. As a key driver of energy performance, the envelope plays a central role in shaping whole life carbon outcomes. Its components, including insulation layers, glazing, and material assemblies, are often adjusted throughout the design process, making them both impactful and flexible. By targeting these elements, the workflow supports exploration of design variations under uncertainty and provides meaningful data to inform low carbon strategies. It allows integrated assessment of embodied and operational impacts without requiring fully detailed specifications, enabling early feedback to guide more sustainable decisions. Initial results from three high-density residential case studies in Delhi show that performance trade-offs emerge consistently. The trade-off analysis reveals that embodied and operational carbon performance cannot be simultaneously optimised. The most balanced envelope configurations fall within EC values of 360 kilograms of carbon dioxide equivalent per square metre and OC values around 30 kilograms per square metre per year, assuming a 30-year lifespan. These Pareto-efficient regions demonstrate how design strategies that reduce operational demand may come with increased material impacts, reinforcing the importance of whole-life carbon-informed decision-making. By focusing on envelope-level variation, this approach supports more agile and targeted low-carbon design exploration during the early stages of the architectural process.

Keywords: Early-stage Design, Embodied Carbon, Design Uncertainty, Life Cycle Assessment (LCA), Low-carbon Strategies

Sezgi Yalcinkaya Hamarat is a PhD student in the Architecture and Sustainable Design (ASD) programme at the Singapore University of Technology and Design (SUTD). Her research focuses on embodied carbon assessment in early-stage architectural design, with particular emphasis on design uncertainty, lifecycle trade-offs, renovation strategies, and avoided carbon in decision-making. Her work integrates parametric design workflows, lifecycle assessment (LCA), and machine learning–based surrogate modelling to support carbon-aware decision-making in the built environment, particularly within high-density urban contexts.

How Cities Translate Participation into Policy: Institutional Uptake of Citizens' Assembly Recommendations in City Governance

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Cities are increasingly deploying citizens' assemblies to inform climate action and sustainable urban planning. However, there is limited evidence on how recommendations by citizens are translated into institutional decisions and policy outcomes. This paper argues that the impact of citizens' assemblies in cities is not only about their deliberative quality alone but also the institutional pathways by which recommendations are interpreted, prioritised and embedded in governance systems, with learning as a useful outcome. This paper examines the Bristol Citizens' Assembly as an in-depth qualitative case study, using semi-structured interviews with assembly members, council officers, facilitators and civil society actors and the output of assembly, council responses and implementation updates. The results show that Bristol was a good case of political ambition, assembly design and formal commitment to embed recommendations into strategic planning and policy narratives. Uptake was uneven and fragile in practice. Translation between departments was uneven, the responsibility of the delivery was diffuse and the progress was based on discretionary leadership instead of routinised processes. Besides the uptake dynamics, the Assembly generated learning effects by reshaping participants' attitudes, making institutions more aware of conditions for effective citizens' engagement and increased the perceived legitimacy of citizen participation. These learning effects were unevenly distributed and spread only weakly beyond the institution, thus having a limited impact on society as a whole. Learning was thus a parallel form of impact that accompanied moments of uptake and reflection. The paper presents Bristol as a good example of participatory innovation and a cautionary example of the limits of participation without institutional anchorage. It concludes that cities that seek to use citizens' assemblies for sustainable planning need to link participatory design with clear uptake architectures (defined decision pathways, organisational ownership and mechanisms for accountability over time).

Keywords: Citizens' Assemblies, Climate Governance, Institutional Uptake, Participatory Governance, Sustainable Urban Planning, Urban Governance

Lawrence Osei Owusu is a PhD Researcher at the University of Bristol whose research examines the conversion of citizen participation into policy action by cities. Using the Bristol Citizens' Assembly as a case study, his work explores citizens' assemblies, climate governance, democratic legitimacy and sustainable city planning. With a background in mining engineering, sustainability and environmental governance, his broader interests include energy transition, urban resilience and democratic innovation in responsive cities.

Investigating Spatial Patterns of Transport Disadvantage using Mobile GPS Data: A Case Study of Low-Income Neighbourhoods in Ho Chi Minh City

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Many cities in ASEAN are experiencing rapid urbanisation and motorisation, resulting in a transport system heavily dependent on motorised vehicles. This model has increasingly shaped the urban form and everyday mobility of residents, where the ownership of private vehicles is prioritized, while those without access are penalized. Such characteristics have had profound implications for low-income residents, who often face increased transport disadvantage such as limited accessibility to essential services, employment opportunities, and social participation due to inadequate mobility options. As concerns over liveability, environmental sustainability, and social equity gain prominence in urban policy and planning debates, understanding and reassessing this transport model has become increasingly urgent. As such, this study aims to investigate the spatio-temporal patterns of transport disadvantage across neighbourhoods in Ho Chi Minh City and explore their relationship with their socioeconomic characteristics. Using geospatial analysis of accessibility of key destinations (e.g., their workplace, healthcare centres, schools, commercial areas, public transport nodes), alongside observable travel features such as trip distance and trip frequency, the study identified clusters of neighbourhoods where transport disadvantage is most prominent. Regression analysis revealed a statistically significant relationship between socioeconomic characteristics and transport disadvantage, which we operationalised as an accessibility-mobility gap. Housing price exhibited a strong positive association with transport disadvantage, where a one-unit increase in normalized housing price was associated with a 0.4707 increase in the transport gap value ($\beta = 0.4707$, $p < 0.001$; 95% CI: [0.427, 0.515]). This suggests that neighbourhoods with higher housing prices tend to experience substantially greater disparities in accessibility. While the model was statistically significant overall ($F = 437.9$), it explained a moderate proportion of the variation in transport disadvantage ($R^2 = 0.16$), indicating that additional factors beyond housing price also play an important role. Through revealing the spatio-temporal and socioeconomic dimensions of transport disadvantage in Ho Chi Minh City, this study aims to contribute to a deeper understanding of how transport systems can either exacerbate or mitigate urban inequality. The findings underscore the importance of reorienting transport planning and policy toward more inclusive and sustainable mobility pathways that support liveable cities and ensure equitable access for all residents amid ongoing urban transformation towards sustainable urban mobility.

Keywords: Social Exclusion, Transport Disadvantage, Vulnerable Groups

Sarah Wong is a Research Assistant at the Lee Kuan Yew Centre for Innovative Cities, with a background in Engineering Systems. Her research focuses on mobility and transport accessibility, particularly in the contexts of rapidly urbanising Southeast Asian cities. She is currently involved in projects examining barriers to mobility and walkability, with the goal of supporting more inclusive, accessible, and people-centred urban environments.

Adaptive Behaviours and Outdoor Thermal Comfort: A Multi-agent System Approach Incorporating Social Archetypes

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Jan Gehl's Life between Buildings links successful urban life to frequent, human-scale social interaction shaped by environmental comfort. In tropical cities, excessive heat can discourage outdoor activity and social engagement. As urban temperatures rise, thermal comfort becomes a critical planning concern, as different Social Archetypes, defined by variations in vulnerability, perception, mobility, and social behaviour, adapt to heat in distinct ways. Some may cope by becoming more isolated at home, while others seek shaded or centrally cooled public spaces that sustain or enhance social interaction. Despite this behavioural diversity, widely used outdoor thermal comfort (OTC) indices, such as PET, PMV, and SET, focus on physiology and remain limited in their capacity to represent the lived experience of different social groups as they navigate diverse microclimates. These measures cannot predict how microclimate conditions influence movement, action, and social interaction across different groups. To address this gap, this study integrates urban microclimate simulations with a multi-agent system (MAS) modelling that incorporates social archetypes. Behavioural survey data is used to define archetypes of (virtual) pedestrians with distinct physiological, perceptual, and socio-behavioural attributes, enabling adaptive route choice, action, and movement within the simulation domain to capture both physiological and behavioural dimensions of thermal comfort. By modelling different behavioural responses, MAS enables the analysis of how various archetypes use, avoid, or retreat from outdoor spaces under heat stress and how social resilience can be fostered even under adverse outdoor thermal comfort conditions. This approach allows actionable insights for urban design, enabling researchers and designers to evaluate how different heat mitigation scenarios affect where people choose to walk, linger, or gather. By linking social archetypes, adaptive behaviours, and OTC, we can learn to shape outdoor spaces that are not only thermally comfortable, but socially inclusive and resilient.

Keywords: Resilient Urban Planning, Agent-based Modelling, Urban Microclimates, Social Resilience

Adelia Ayu Sukma is a researcher at the Singapore-ETH Centre, contributing to the Cooling Singapore project with a focus on urban microclimate modelling and microscale environmental assessment. Her work advances understanding of how urban environments shapes thermal conditions. Through integration of modelling, simulation and data-driven approaches, she supports the development of practical recommendations for more sustainable and heat-resilient cities. She is currently expanding her research to examine how urban heat affects individuals, integrating more physiological and social-behavioral dimensions to inform more responsive and human-centered design.

Underground data centres: leveraging subsurface space for sustainable urban digital infrastructure

Mahak AGRAWAL
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Rapid growth in digital services is driving unprecedented demand for data centres in urban India, particularly in cities such as Mumbai, where surface land scarcity and high energy consumption pose significant environmental and social challenges. Globally, data centres account for approximately 1 to 1.5% of total electricity consumption, a figure projected to rise sharply alongside artificial intelligence (AI) adoption and the proliferation of connected devices. In India, the data centre market is expanding at over 15% annually, placing mounting pressure on urban land and energy systems already strained by density and climate risk. This paper explores an innovative approach: the use of underground spaces for data centre deployment, drawing on comparative insights from research and projects in Switzerland and Finland. These cases demonstrate how subsurface infrastructure can optimise energy efficiency through natural thermal regulation, which reduces cooling energy requirements by up to 30 to 40%; reduce land-use pressures; and integrate with existing urban systems whilst maintaining resilience and operational reliability. By synthesising technical, regulatory, and urban planning perspectives, the paper examines the feasibility, risks, and co-benefits of underground data centres in the Indian context. Drawing on lessons from Helsinki, Finland and Flums, Switzerland, it proposes an adaptation framework addressing geological suitability, regulatory pathways, and community considerations, offering a roadmap for cities to harness subsurface assets to support digital infrastructure sustainably. The findings aim to inform data-driven urban planning, demonstrating how cities can balance digital expansion with liveability and environmental stewardship. This research contributes to the Science of Cities discourse by linking innovative underground solutions to responsive urban management and sustainable infrastructure design.

Keywords: data centres, digital infrastructure, energy efficiency, subsurface spaces, sustainable urbanism, underground spaces

Mahak Agrawal is an urban planner, sustainability expert, and climate policy professional who believes meaningful climate action requires equal parts science, storytelling, and stubborn optimism. Her work translates complex challenges into ideas useful in the real world. She serves as Head of India at Riding Sunbeams, a UK social enterprise integrating solar energy into rail and transit infrastructure, building partnerships across ministries, think tanks, and the private sector. Mahak is also founder of All Bits Count (ABC), a creative climate science project launched at the UN Summit of the Future and COP29 in 2024, rooted in the belief that sustainability communication should be accessible, honest, and human.

Creating the Frontiers of the Vibe-coded Smart City

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As cities confront rapid AI-driven transformations, a key challenge lies not in technology availability but in building human capability to adopt, govern, and innovate with AI responsibly. Since January 2025, the Singapore University of Technology and Design (SUTD) repositioned itself as the world's first Design·AI university, advancing a "Design·AI Trilingual" model that integrates design, artificial intelligence, and domain expertise to strengthen human–AI collaboration. This study examines outcomes from multiple implementations across education, industry, and public-sector contexts in terms of future of education and future of work. Using a mixed-methods approach including combining (1) results from five workshops aimed at improving professional's AI proficiency, (2) digital twin simulations for strategic organisational decision making, and (3) qualitative analysis of human–AI interaction, we evaluate how Design·AI interventions influence organisation innovation transformation and technology adoption. Findings show that participants across different sectors rapidly designed concrete AI use cases within a one-day workshop, achieving perceived productivity gains of 35–60%, reductions in prototyping time, and increased confidence in AI use. Additionally, quantitative results indicates that Design·AI workshops produced substantially statistically significant improvements in perceived ease of use of AI with a large effect size (Cohen's d = 0.8), lowering barriers to AI adoption at scale. Qualitative insights further reveal a shift from viewing AI as an automation tool toward treating AI as a collaborative teammate, while preserving "pockets of human centrality" in judgment, ethics, and creativity. The study concludes that Design·AI offers a human-centred, socio-technical pathway for cities to accelerate AI adoption responsibly, enhance workforce innovation capacity, and strengthen urban resilience in the AI age. The study argues that the vibe coded smart city provides a unifying framework for aligning AI-enabled learning, work, and decision-making, offering cities a practical pathway to scale AI adoption responsibly while preserving critical human-centred in ethics, creativity, and governance.

Keywords: Design·AI, Digital Twin Simulations, Human–AI Collaboration, Innovation Capacity, Smart Cities, Workshop Analytics

Dr. Dinithi Jayasekara is a Research Fellow at the Lee Kuan Yew Centre for Innovative Cities (LKYCIC). Her research investigates the dynamics of human–AI interaction by integrating experimental and behavioral economics with psychology. She specializes in trust calibration within AI systems, AI-augmented strategic decision-making, and the evolving nature of human–AI co-creativity. Ultimately, her work seeks to understand how these technologies are redefining the future of organizational structures and educational paradigms.

Data Driven Activity Chain Modelling Methodology for Geodemographic Profiling of Singapore Residents and Analysis of Attitudes Towards Active Lifestyles

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There is increasing emphasis on designing urban environments to inspire healthier living and make active lifestyle choices intuitive for everyday life. As governments expand preventive care and digital health initiatives, an important opportunity has emerged to more deeply integrate urban analytics, data science, and personalised digital health solutions to deliver targeted, place-based interventions that reflect how people live, move, and interact with cities. The limited integration across these domains presents a timely opportunity to pioneer a multidisciplinary research field with transformative potential for public health policy and planning. This paper presents a data-driven framework for modelling the geodemographic profiles of residents in Singapore to enable personalised, place-based health promotion at scale. Drawing from a mix of administrative, health, activity and mobility data, the research develops a methodology that classifies individuals into lifestyle archetypes based on their activity and travel patterns, socio-demographic characteristics, and daily routines. The framework integrates heterogeneous datasets and leverages mobile applications to capture behavioural preferences and sensitivities across population segments, creating a data foundation for tailoring interventions to both lifestyle and neighbourhood context. We share early findings from on-going data assembly effort, as well as insights for post-research deployment that can support longitudinal updates, operational deployment, and inter-agency integration. This research aligns with Singapore's strategic vision of preventive healthcare by pioneering an advanced digital capability to deliver personalised health promotion at scale. By generating granular insights into how the built environment shapes health behaviours across space and time, the study advances the scientific understanding of health–built environment dynamics. It further equips policymakers with actionable tools to design targeted preventive-health interventions, optimise resource allocation, and improve engagement with underserved population segments. Beyond the Singapore context, the proposed framework offers a transferable model for cities seeking to integrate urban analytics and personalised digital health platforms into next-generation preventive healthcare strategies.

Keywords: Activity-chain Modelling, Digitalisation, Geospatial, Population Segmentation, Public Health

Dr. Alvin Chua is the Acting Director of the Data Science Division at JTC Corporation, where he also serves as the organisation's Chief Data Officer. In this role, he is responsible for enterprise-wide data strategy and governance, and is spearheading JTC's efforts to build, integrate, and operationalise artificial intelligence capabilities across the organisation. Alvin holds a joint appointment with the National University of Singapore, where he is a Research Assistant Professor at NUS Cities. In this capacity, he contributes to the development of urban science capabilities in areas such as geodemographic modelling, studies of town typology, and AI for the Built Environment, fostering translational research that connects scientific insights to real-world planning and governance needs.

DesCartes Programme: Intelligent Modelling for Decision-making in Critical Urban Systems

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As cities grow more complex and interconnected, decision-makers face increasing challenges in planning, operating, and protecting urban systems. Cities concentrate populations, infrastructure, and activities, making them highly sensitive to environmental conditions that directly impact health, energy use, and safety. Predicting these complex and rapidly evolving dynamics remains a major challenge, as it involves multiple interacting physical processes across scales. The DesCartes programme hosted by CNRS@CREATE, the first and only subsidiary of CNRS (French National Centre for Scientific Research) and funded by the NRF (National Research Foundation) Singapore, is a multidisciplinary initiative combining scientific excellence with practical urban applications to support more sustainable and resilient cities. DesCartes develops Hybrid AI Digital Twins, meaning models that virtually replicate how environmental conditions affect urban infrastructure and populations. By combining physical knowledge enriched by AI with data, these models deliver accurate, real-time simulations while requiring limited data. This enables cities to make faster and more informed decisions. The DesCartes platform integrates these capabilities into a single collaborative tool, allowing stakeholders to simulate scenarios, anticipate risks, and optimize operations. In Singapore's Marina Bay district, the Digital Twin models interactions between urban climate and infrastructure, supporting applications such as pollutant dispersion, thermal comfort, predictive maintenance, and emergency response. In the event of a chemical incident, the system can identify the source, predict pollutant spread, and recommend optimized evacuation routes based on real-time traffic conditions. This platform is designed to be transferable across cities and sectors, from urban environments to port and airport domain. Importantly, DesCartes adopts a human-centered approach, involving policymakers, operators, and citizens to ensure solutions are trustworthy, ethical, and aligned with societal needs. By bridging research and real-world implementation, the programme demonstrates how Digital Twins can become practical tools for cities to anticipate challenges, improve urban systems, and build a more sustainable future.

Keywords: Digital Twin, Environment Modelling, Hybrid AI, Multidisciplinary Programme, Singapore-France Collaboration

Flora Luciani is Program Officer for the DesCartes Programme at CNRS@CREATE, where she serves as the primary liaison for a 30M SGD international R&D initiative involving over 200 researchers and 40 partners across academia, industry, and government. She holds dual Master's degrees in Engineering and Management, and previously worked as an Innovation Project Manager and Research Engineer, including at CNRS@CREATE. Her role spans strategic development, coordination of government – academia collaborations, stakeholder engagement, and scientific outreach. She also oversees program operations, communication, and high-level representation, contributing to the programme's visibility and impact in Singapore's innovation ecosystem.

Awe in Public Life

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What if cities were designed not only to move people efficiently, but to move them emotionally? This presentation explores the science of awe and its relevance for urban life, public space, and civic connection. Awe is often described as a response to vastness: moments that stretch our sense of scale, meaning, or possibility and invite us to revise how we see ourselves and the world. Research suggests that awe can quiet the narrow self, increase generosity, strengthen social connection, and orient people toward collective concerns. Cities are powerful awe-making environments. Their skylines, rituals, histories, crowds, sacred spaces, public art, trees, waterfronts, and everyday encounters can create moments of wonder that are both personal and shared. Building on explorations in the Cities of Awe Lab this presentation considers awe as a civic resource: something that can be noticed, mapped, cultivated, and made more equitable in public life and suggests that awe in cities can be a way to foster community, belonging, well-being, and collective imagination through place-based explorations. Rather than treating awe as rare or monumental, the presentation asks how urbanists, designers, and communities might recognize awe in everyday public life. How do cities help people feel part of something larger than themselves? How can public spaces invite curiosity, humility, memory, care, and connection? And what might change if awe became a serious measure of urban flourishing? In an age of loneliness, fragmentation, and ecological uncertainty, cities of awe point toward a public life shaped not only by access and function, but by wonder, meaning, and shared belonging.

Keywords: Civics, Community, Meaning, Public Life, Shared belonging

Louise Kielgast is a director at Gehl with twenty years of experience applying a people-driven strategic approach to creating change in urban environments. At Gehl, Louise is leading the strategic focus on creating thriving communities through a place-based approach to health and well-being, including establishing collaborations across sectors and disciplines towards greater collective impact. With a background in social anthropology, she focuses on health through the lens of people's everyday experiences within different cultural and political contexts.

Future-Positive Cities: Using AI to Design for Climate, Ecology, and Liveability

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Cities are highly effective at concentrating opportunity—but also risk. Today, climate change, biodiversity loss, and rapid urbanisation are converging in ways that challenge conventional approaches to urban development. While sustainability has traditionally focused on reducing negative impacts, this is no longer sufficient. What is increasingly required is a shift toward future-positive cities—urban systems that actively contribute to environmental regeneration, social well-being, and long-term resilience. This presentation explores how such a shift can be enabled through the integration of design, data, and artificial intelligence. Rather than automating design, AI offers the potential to link spatial decisions to measurable environmental and social outcomes, allowing designers and planners to work with a clearer understanding of consequences. By enabling real-time evaluation and scenario exploration, AI supports a transition from static solutions to adaptive, system-oriented approaches. Drawing on research from the Singapore University of Technology and Design and the Future Cities Laboratory Global, the talk highlights how data-driven methods can inform key urban challenges, including outdoor thermal comfort, ecological connectivity, and the integration of multiple performance objectives at the district scale. These examples demonstrate how relatively small design interventions can generate cascading benefits across climate, liveability, and economic performance. Ultimately, the presentation argues for a redefinition of urban design practice—from optimising individual metrics to integrating complex systems—and for a renewed role of designers as mediators between spatial form, environmental processes, and data-driven intelligence.

Keywords: Climate-Responsive Design, Future-Positive Cities, Integrated Urban Systems, Urban AI

Prof. Dr. Thomas Schroepfer is Full Professor of Architecture and Sustainable Design at the Singapore University of Technology and Design and Director of the Future Cities Laboratory Global at the Singapore-ETH Centre. His work focuses on the future of cities at the intersection of design and advanced technologies, with an emphasis on sustainable and future-positive development. He leads interdisciplinary research on high-density urban environments and collaborates with government and industry to translate research into practice, shaping climate-responsive urban systems.

Author Index

Only presenters are shown in this table, sorted by their last names in alphabetical order.

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