20. Co-creating urban futures: Digital technologies, urban visions, and expanded planning practices | Session: Fri May 8th, 10:00-11:30

Chairs:
Päivi Keränen, Metropolia University of Applied Sciences, Tampere University
Jenni Radun, Metropolia University of Applied Sciences

Presentations:

1. From Digital Twin to Cityverse: Immersive Urban Platforms as Tools for Hope and Resilience

Janset Shawash, Metropolia University of Applied Sciences, Helsinki XR Center, Tampere University

Urban digital twins are rapidly evolving from static 3D city models into immersive, interactive environments, sometimes called cityverses, where citizens can explore future urban scenarios, engage with real-time city data, and participate directly in planning decisions. At the building and district scale, digital twins already support operational functions such as energy management, maintenance planning, and performance monitoring. At the city scale, immersive interfaces are extending these capabilities into the civic realm: enabling citizens to visualise proposed developments, interact with accessible simulations of environmental and urban processes, and participate in democratic decision-making about the futures of their neighbourhoods. Drawing on a review of urban digital twin research (2020–2025) and findings from the Metadata to Metaverse (MD2MV) project at Metropolia University of Applied Sciences, we trace this evolution and examine its significance for urban governance, identifying key use cases from AR-enabled transit planning in Columbus, Ohio, to participatory community design in Los Angeles. The dual-use nature of these technologies is also explored: Ukrainian engineers are applying digital twins to assess and reconstruct war-damaged cities, while the 2026 US-Iran conflict demonstrated that the cloud infrastructure underpinning urban platforms can itself become a military target. We argue that the cityverse holds genuine potential to make cities more participatory, adaptive, and resilient, and that cities of hope require digital infrastructure worthy of that ambition.

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2. PhD Studies of Co-Designing Intelligent Technologies for neighbourhood communities in Nordic Superblocks

Jouko Makkonen, Tampere University

Digital technologies have accelerated social, digital, and spatial fragmentation in neighbourhoods, but could they also be used to achieve the opposite? This presentation examines how intelligent technologies – proactive, data-driven systems involving AI – can support the use of shared spaces and advance neighbourhood communality in Nordic Superblocks. Nordic Superblock concept promotes sustainable living through cooperation and resource sharing among housing blocks. The presentation is based on four empirical studies conducted as part of PhD research contributing to the field of human-computer interaction.

The findings introduce four conceptual roles for intelligent technologies: Community Sheriff, Matchmaker, Facilitator, and Tutor. Through these roles, intelligent technologies can support meaningful connections between shared spaces, the activities taking place within them, and the social interaction among members of the neighbourhood community. Co-design with and for the neighbourhood community, as well as close cooperation between space design and technology design, has proven essential for ensuring contextual relevance and supporting community building. A design framework for advancing communality with intelligent technologies in Nordic Superblocks considers design factors and outcomes across three levels, the micro-level (individual entities such as residents, groups, or specific technologies), the macro-level

(relationships and interactions between these entities), and the meta-level (broader values ethics, and societal impacts).

The research highlights both the potential and the risks of such technologies, including increased social interaction and participation in neighbourhood matters, as well as privacy concerns and digital exclusion. Intelligent technologies can reduce frictions related to organisation, access, and maintenance; lower social thresholds; foster place attachment; and support the formation of social ties.

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3. Lowering the Entry Barrier to Experiencing Urban Futures: An Immersive Virtual Reality Toolkit for Planning and Evaluating Urban Street Interventions

Omkaranathan Ravindran[1], Olli Jakonen[1], Pawan Gami, Petri Kangassalo[2], Tuuli Toivonen[1]

[1]University of Helsinki
[2]Aalto University

Urban planning seeks meaningful involvement of citizens and stakeholders in shaping the futures of urban environments. Planning proposals are often communicated through maps, renderings, and GIS-based visualizations. While valuable, they often struggle with conveying experientiality. Immersive technologies can bridge this gap, but their adoption in urban planning remains limited. Developing and running immersive environments is often technically complex, computationally demanding and costly. This requires specialized expertise and extensive preparation, maintaining a high entry barrier.

We present our UrbanISE VR project developing and testing a ‘VR-in-a-suitcase’ prototype kit. It enables exploration and evaluation of urban street interventions. It integrates a) interactive virtual urban environments developed using a simulation engine with b) physical navigation devices such as bicycles mounted on smart trainers. This enables users to move through simulated urban spaces in real life scale and to provide feedback based on an immersive experience. The toolkit comes with modifiable neutral street environments allowing visualizing different interventions, such as greenery configurations, modification of street layouts, and seasonal and environmental conditions. This lowers the entry barrier for VR adoption for cities, urban planning practitioners, and researchers.

UrbanISE VR builds on a VR implementation created for the ERC-funded GREENTRAVEL project at the Digital Geography Lab of the University of Helsinki. It is now further developed through an ERC Proof-of-Concept grant with stakeholder validation in European cities. We aim to support discussions around urban design scenarios and the possibilities of enabling participants to explore alternative interventions before physical implementation. We welcome discussion on adoption barriers and the challenges of predetermining toolkit features to meet the needs of planning practitioners.

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4. Excavating Broken Smart Artifacts

Debra Mackinnon, Lakehead University
Sandra Jeppesen, Lakehead University

Amidst the hype and enduring ‘corporate storytelling’ of the smart city, we have seen the cracks and breakdowns in the ‘smart ordinary now’ (Farías & Widmer, 2017). In cities like Seattle, Louisville, Toronto, and New York, when private ventures focused on implementing smart technologies find themselves having to contend with the realities and messiness of cities, they often abandon their projects, leaving a trail of smart city waste. In addition to broken roads, deceitful data sharing agreements, abandoned e-scooters, and shattered smart kiosks, municipalities’ pursuit of “smart” can result in the co-presence of multiple fragmentary urban technologies. Drawing on theories of urban assemblage and cosmopolitics (Blok & Farías, 2016; Coutard & Guy, 2007; Latour, 2004, 2005; Stengers, 2005, Suchman, 2012) this paper focuses on the conflictual politics and materialities of actual smart urban artifacts. Specifically, we examine (1) the infrastructural impact on cities as they are left to cope with the cost and disruption, (2) the

performative public engagement and lack of spaces for dialog with denizens and other stakeholders, and (3) lingering discursive effects of articulating needs and visions to align with smartness. Drawing on public discourse that foregrounds cases of disruption, failure and breakdown, we ask what these broken artifacts teach us that might contribute to community organizing for dialogue, recourse, accountability, and justice. Focused on urban cosmopolitical configurations of urban technologies, we contend that lingering smart assemblages may offer hidden glimpses into opportunities for citizen appropriation of data, infrastructures, and smart technologies with the objective of improving community outcomes.

20. Co-creating urban futures: Digital technologies, urban visions, and expanded planning practices | Session: Fri May 8th, 14:00-15:30

Chairs:
Päivi Keränen, Metropolia University of Applied Sciences, Tampere University
Jenni Radun, Metropolia University of Applied Sciences
Teija Vainio, Tampere University
Suvi Varissaari, City of Tampere
Minna Säpyskä-Aalto, City of Tampere
Jenna-Riia Oldenburg, Sitowise
Jasper de Jonge, City of Tampere

Presentations:

1. Who Is Still Dreaming? Urban Imagination After the End of Optimism

Narmeen Marji[1] [2], Janset Shawash[1] [2] and Santeri Saarinen[1]
[1] Metropolia University of Applied Sciences / Helsinki XR Center
[2] Tampere University

Throughout history, imagining the future city has been one of humanity's most persistent collective acts. Each era has entangled its dominant technologies with new ways of dreaming urban life, from the geometric precision of Renaissance ideal cities through the radical spatial visions of Archigram and Cedric Price to the networked urbanism that emerged with the internet. Today, AI and virtual world platforms continue this trajectory, enabling millions of people to design, inhabit, and share speculative environments at unprecedented scale.

Yet something has shifted. Popular culture is saturated with urban dystopia, smart city discourse has replaced imagination with optimization, and a convergence of climate crisis, geopolitical fragmentation, and economic precarity has contracted the horizon of collective possibility. The most visible futures on offer are either catastrophic or privatized. We appear to face not a shortage of technological capacity but a crisis of belief that alternative urban futures are achievable at all.

We examine that crisis here but refuse to stop there. Drawing on emerging research into young people's spatial practices in virtual worlds, speculative visual culture, and vernacular futurism, we argue that imaginative capacity has not disappeared but migrated, into platforms, formats, and communities that institutional urban thinking often cannot see or does not take seriously. The gap between where imagination actually lives and where institutions look for it may constitute the deeper problem. We close by reframing hope not as optimism, which is merely a prediction, but as practice: a disciplined attention to possibilities that already exist in the present but have not yet been recognized.

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2. Memory Twin – Digital dimensions of the past, present, and future of urban industrial environments and their cultural heritage

Jenna-Riia Oldenburg, Lead Consultant, Built environment digitalisation, Sitowise Oy / PhD researcher, Doctoral Programme in Business and Technology Management, University of Tampere
Minna-Marjukka Kaikkonen, PhD researcher, Doctoral Programme in History, Culture and Arts Studies (Juno), University of Turku

We approach the theme “City of Hope” from the perspective of Smart Heritage, integrating cultural heritage and the smart city concept. This approach emphasises the role of digitalisation as an enabler of polyphonic urban development.

Instead of authorised and tangible definitions, cultural heritage should be seen as a social process in which identities are actively constructed and negotiated. It is shaped through dialogue among diverse stakeholders, including the public and marginalised voices. Digitisation of cultural heritage has evolved from early 2D imaging to advanced 3D technologies. However, 3D modelling mainly focuses on physical

and material aspects, often neglecting the socio-cultural and intangible dimensions of heritage. In addition, the use of 3D and other novel technologies might create further barriers to the participation of marginalised groups. The concept of Memory Twin moves digitisation beyond visual replication towards participatory, meaning-making digital ecosystems that incorporate the intangible, emotional, and narrative dimensions of heritage.

In our presentation, we take the idea of Memory Twin further towards its participatory role, asking how it could serve as a platform for citizen participation. The object of our study is Metsä Board's historic Tako paperboard mill, located in the centre of Tampere. Founded in 1865, the mill was the last operating factory in central Tampere and a pioneer of the wood-processing industry. The protected factory building – part of the nationally significant Tammerkoski industrial landscape – is for sale, with its intended future use yet unplanned.

The situation offers our study a unique opportunity to explore how Memory Twin could and should be developed to ensure an economically, socially, and culturally sustainable future for this unique landmark.

3. Selective Precision: Managing the Performativity of Urban Planning Visualisations

Jenni Kuoppa[1], Helena Leino[1], Markus Laine[1] & Raine Mäntysalo[2]

[1] Tampere University, Faculty of Management and Business, Politics of Nature and the Environment Research Group
[2] Aalto University, Department of Built Environment, Spatial Planning and Transportation Engineering Research Group.

The performative role of visualisations, particularly photorealistic renderings, has been acknowledged in planning literature. These visuals not only communicate future plans to a wide range of stakeholders but also support specific narratives and storytelling about the envisioned futures. Existing research on renderings has mostly focused on their manipulative potential and the risks of generating disinformation or empty promises. On the other hand, images can be used as part of stories and narratives that serve as empowering tools for change and for imagining new alternatives

However, how planners engage with urban planning renderings in actual planning processes remains understudied. This paper explores how they perceive and manage the performative functions of renderings as part of broader storytelling in urban planning.

Drawing on observational and interview data from a Finnish planning case and using urban planning renderings as our supplementary data, we identify three key approaches: persuasion, avoiding closure, and managing expectations. The planners in our case study were very conscious of and concerned about the power and persuasive impacts of visualizations. For planners, the challenge lies not only in using images effectively, but also in navigating and controlling their influence throughout the planning process. This understanding is timely, as the rapidly evolving context of generative AI is transforming both production and the aesthetics of architectural and urban renderings.

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4. Augmented Inclusion: Generative AI and XR as Tools for Co-Creating the 'City of Hope'

Kashif Ali Sabiri, Department of Education and Culture, Tampere University

As cities strive to become "Cities of Hope," the role of digital technology in urban planning is shifting from mere data management to a tool for democratic engagement and co-creation. This presentation explores how Generative AI and Extended Reality (XR) can expand traditional planning practices by making complex urban visions accessible and interactive for diverse citizen groups.

Drawing on the author's extensive background in ICT and current doctoral research at Tampere University, this paper demonstrates how AI-driven educational platforms and VR simulations can serve as "digital commons." These tools allow residents, particularly those often sidelined in urban discourse, to visualize, simulate, and provide feedback on urban developments in real-time. By lowering the barrier to technical understanding, immersive technologies foster a more inclusive form of co-creation.

The session will analyze the pedagogical shift required for planners to use these "technologies of hope" effectively. It argues that for digitalization to truly serve the inclusive city, it must move beyond top-down implementation toward a participatory model where technology empowers the community to co-author their urban future.
