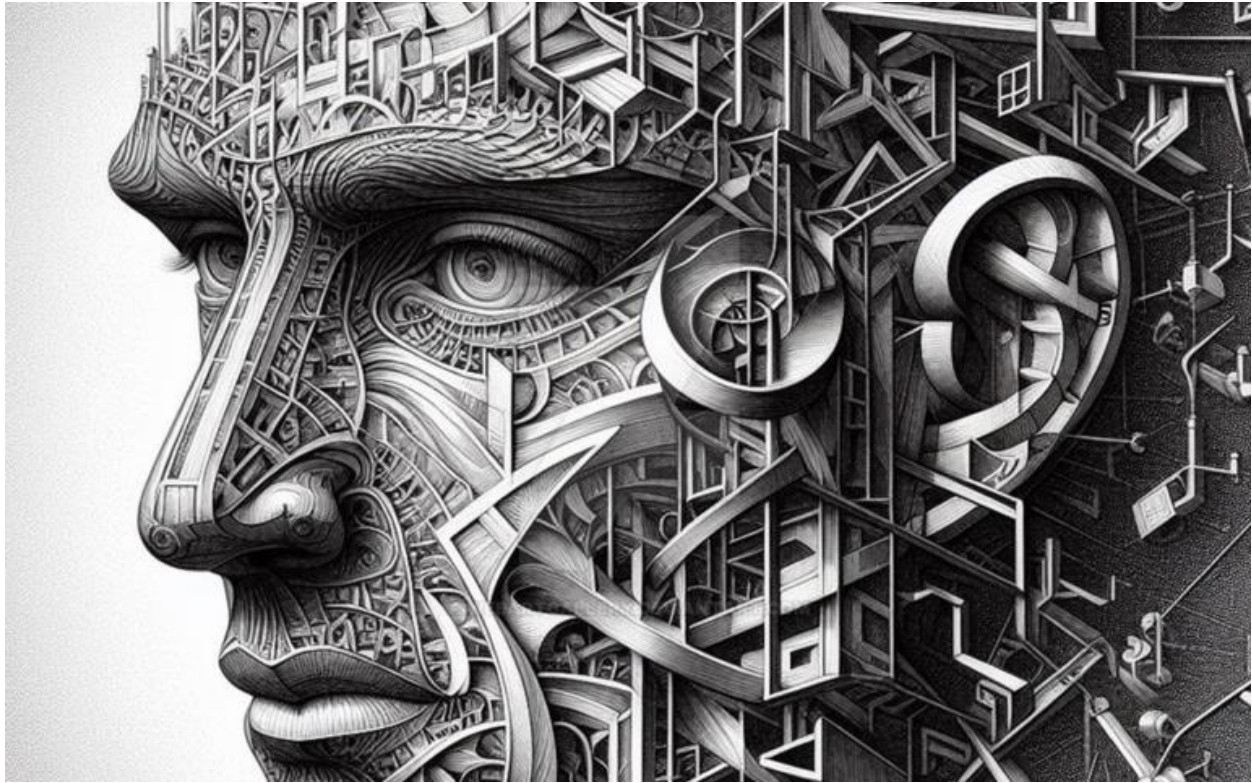# Getting Lost in Buildings

05 September 2024, 9:15 am–5:00 pm

UCL at Here East Auditorium

Queen Elizabeth Olympic Park

London

E20 3BS

Programme

09.15 - Registration and tea/coffee

09.45 - Introduction & welcome

10.00 - Michal Gath-Morad

10.30 - Klaus Gramann

11.00 - Break

11.30 - Tom Lloyd

12.00 - Lara Gregorians

12.30 - Sam McElhinney

13.00 - Lunchbreak

14.00 - Flash talks

15.00 - Natasha Reid

15.30 - Break

16.00 - Matthias Gruber

16.30 - Panel/audience discussion

Michal Gath-Morad

Dr. Gath Morad is an Assistant Professor at University of Cambridge's Department of Architecture, where she directs Cambridge Cognitive Architecture. She is an architect holding a PhD in cognitive science, seeking to quantify how architecture impacts spatial cognition, translating behavioural findings into evidence-based design tools, and analysing how the use of evidence influences design cognition.

Demystifying spatial cognition research in architecture: Applications, challenges and future outlook

The increasing complexity of architectural projects underscores the need for generating and disseminating robust evidence at different stages of the design process to inform design decisions and outcomes. While there is ample research on the environmental aspects of architecture, quantifying and measuring how architecture affects cognition and behaviour remains a challenge. This talk aims to showcase how theories and methods from spatial cognition can be applied to address this challenge. Through a series of research projects applied to diverse building domains spanning hospitals, cruise ships, and space stations, I will unpack this design approach, discuss its current limitations, and outline future opportunities for its development to ultimately create human-centered environments that celebrate human creativity empowered by scientific evidence.

Klaus Gramann

Klaus Gramann received his Ph.D. in psychology from RWTH Aachen, Aachen, Germany. He was a postdoc with the LMU Munich, Germany, and the Swartz Center for Computational Neuroscience, University of California at San Diego. After working as a visiting professor at the National Chiao Tung University, Hsinchu, Taiwan he became the chair of Biopsychology and Neuroergonomics with the Technical University of Berlin, Germany in 2012. He has been a Professor with the University of Technology Sydney, Australia and is an International Scholar at the University of California San Diego. His research covers the neural foundations of cognitive processes with a focus on the brain dynamics of embodied cognitive processes. He directs the Berlin Mobile Brain/Body Imaging Labs (BeMoBIL) that focus on imaging human brain dynamics in actively behaving participants.

Human brain dynamics during navigation - from the lab to the real world

The human brain is embodied, intertwined with our physical form, leveraging this embodiment to enhance perception in complex and dynamically changing environments. Traditional brain imaging techniques have largely overlooked these aspects of embodied cognition. However, recent years have witnessed a significant paradigm shift, with established brain imaging technologies being employed outside conventional experimental frameworks to record brain dynamics in actively behaving individuals. This evolution in research methodologies introduces new challenges in both hardware and analytical approaches but allows for unprecedented insights into human brain activity underlying natural cognition.

In this presentation, I will provide an overview of research in the Berlin Mobile Brain/Body Imaging Labs that focus on the neural dynamics underlying human navigation using mobile EEG technologies. Utilizing Mobile Brain/Body Imaging (MoBI), I will present findings from experiments that examine multisensory integration during navigation, both within classical laboratory protocols and in scenarios that permit full-body movement in virtual and real-world settings. The results reveal substantial changes in brain dynamics in actively behaving participants compared to traditional brain imaging configurations, highlighting important implications for future research directions.

Tom Lloyd

Tom is co-founder of Pearson Lloyd. He trained in Furniture Design at Trent Polytecthnic, before completing a Master's in industrial design at the RCA in 1993. Tom founded Pearson Lloyd with Luke Pearson in 1997. Tom's particular interest lies in design's role in society and has a strong focus on strengthening Pearson Lloyd's circularity practice. Since 1997, Pearson Lloyd has established a cross-sector position built on insights from the social, economic, and environmental challenges facing people at home, work and on the move. In 2023, Pearson Lloyd were awarded 'Designer of the year' by Dezeen. Tom was Master of the Faculty of Royal Designers for Industry from 2021 to 2023, and in 2022 was awarded an Honorary Doctor of Design by Nottingham Trent University.

www.pearsonlloyd.com

A Better A&E Experience - Informing the Patient Care Experience

"A Better A&E" is a design initiative introduced in over 20 NHS trusts to improve the patient and visitor experience in UK Emergency Departments. Developed by Pearson Lloyd's multidisciplinary team, it addresses the significant issue of violence and aggression toward NHS staff, which costs over £70 million annually. The approach includes three solutions: The Guidance Solution, which uses information graphics to guide patients and reduce frustration; The People Solution, offering ongoing staff support; and the Toolkit, which compiles best practices for designing new EDs. Evaluations show a 50% reduction in aggressive incidents and improved staff morale and wellbeing."

Lara Gregorians

Lara is a Postdoctoral Researcher in the Architectural Cognition in Practice group within Future Cities Lab Global, at the Singapore-ETH Centre. She holds a PhD in Neuroarchitecture from the Spatial Cognition Lab within the Institute of Behavioural Neuroscience at UCL, and a Master's in Health, Wellbeing and Sustainable Buildings from the Bartlett, UCL. Her work centres on understanding how the built environment impacts human behaviour, perception and cognition.

Moving through architectural spaces involves spatial and aesthetic processing

Almost all of our daily actions and events take place within a built environment, and these experiences involve many complex processes. On entering a space you will take in sensory information, form a mental map of the area, consider how it makes you feel, and ultimately make a series of decisions that (ideally) complement your given task or goal. This series of considerations can be seen as a combination of spatial, aesthetic and affective processing. However, there has thus far been little empirical crossover between these three pillars. This talk brings these worlds closer together, to better understand how spatial, aesthetic and affective processing interrelate in architectural experience to inform how we map our environments. Lara will present an fMRI study that explores the brain regions that support spatial and aesthetic processing of architectural environments, and consider how affect and other properties of spaces impact memorability. This work develops the idea that our ability to mentally construct and map space is an interaction of these processes, which opens the path to future design questions.

Sam McElhinney

Sam McElhinney is an Architect and Associate Professor at the Canterbury School of Architecture and Design, where he runs the Architecture degrees. He is also the founder of isovists.org, which hosts a free multi-platform spatial analysis software. Sam's research involves the development of realtime analytic models that aid our understanding of our understanding of space; as well as more than a passing obsession with the mythological structures of labyrinths and mazes.

A brief history of getting lost

Navigation, or the art of not being lost, is often problematised; by designers; by researchers; and by individuals in the moment of embodied experience. Typically, such a viewpoint is made material and spatial by the idea or form of a *maze* that must be solved, or to which we need simply apply a good 'wayfinding' schema. Perhaps the most dramatic, if fanciful, depiction of the trope is the common interpretation of the ancient myth of the Minotaur; the apocryphal monster lurking at the heart of Daedalus' maze, to be slain by our brave exploring hero Theseus. But what if the Minotaur had something that they wanted to teach us all, about how the structuring of space, time and people into *labyrinthine* known-knowns, known-unknowns, and all the rest, affords, encodes and maintains social hierarchies that were and are central to the emergence of human civilisation, governance and urban living? Sam's presentation will explore such themes and discuss how an understanding of the importance of *being lost* and of the unifying structure of the labyrinth can reframe the challenges of navigation, illuminating how we as individuals within society may occupy, experience and explore space. In the process he will introduce Benedikt's *isovist*, both as a singular, egocentric unit of space that can be quantified to map local embodied experiences, and also as route to the construction of broader relational structures, known as isovist cascades. Here he will outline recent work that may relate such structures to cognitive mechanisms and patterns of spatial discovery (including aha! moments), providing potential insights into the capacity of the structures of complex buildings to afford spatial learning and understanding.

Natasha Reid

Natasha Reid, MA (Cantab), DipArch, FRSA. Founder, MATTER SPACE SOUL

Natasha Reid is founder of MATTER SPACE SOUL, a progressive spatial design lab and consultancy shaping places for health, wellbeing and social sustainability. After practicing in architecture and urban design at award-winning studios, she specialised in innovating new approaches at the intersection of design, human sciences and the arts since 2013.

She created the experience-led Place Quality Model, shortlisted for an RTPI Planning Excellence Award, and subject of an academic study funded by National Institute for Health and Care Research. She is a Fellow with the Center for Conscious Design, and co-director of Considerate Urbanism; a movement for more human-kind futures.

www.matterspacesoul.com

Compassionate Places: Towards new forms of experience-led, transdisciplinary spatial design in practice

Summary: This presentation will share the implementation of a new transdisciplinary model for research-informed, healthy, human-oriented design into policy and practice as a demonstrator to inform wider systemic change. It aims to support a shift towards a new urban paradigm.

There is recognition that architecture and urban design has a significant impact on people's mental health, as well as social connection and inclusion. However the business-as-usual practice of design, planning and development does not typically integrate knowledge and research from many other disciplines, such as neuroscience, that address how people are affected by places. It is increasingly argued that current practices of design are insufficient to protect and improve health, or meet people's needs (McCay and Roe 2021, Pineo 2022, OECD 2023). Despite the profound impacts that the built environment has on people, there is currently no unified, structured model for design that can systematically and holistically address the complexity of human needs, nature and experience. This includes the key topics of mental mapping, navigation, legibility and how wayfinding can contribute to a sense of comfort, ownership and belonging.

The Compassionate Places approach seeks to bring together knowledge from different disciplines to bridge the gap between research and practice. It considers the built environment not only as a physical "bricks and mortar" landscape, but also as an ecology of experiences, affects, outcomes, relationships and societal constructs. In this way, it can act as a medium through which to support people to flourish and communities to thrive. Rooted in a longstanding architectural and urban lineage of humanistic and social approaches, it argues that insights and cutting-edge research from different discplines must be embedded and operationalised into new transdiscplinary design formats to maximise the full potential of places to create benefits for human health and social wellbeing.

Implemented into a London local authority's planning requirements in 2023, the "Place Quality Model" is a new design framework and intervention based on this conceptual approach, aiming to embed health, social wellbeing and inclusivity into the design and planning process.

Drawing from a wide variety of areas, including public health and the human sciences, it sets out a multidimensional, structured approach to embed human benefits into the everyday practice of shaping places, by defining detailed spatial qualities relating to quality of life outcomes. Critically it creates a lever for change, by requiring these human and social benefits to be explicitly demonstrated as part of planning permission requirements for the first time.

Currently undergoing evaluation by public health academics at the University of Bristol as part of the PHIRST (Public Health Intervention Responsive Studies Team) scheme, the goal of this project is to contribute to transforming current design, planning and policy approaches not only to include human and social benefits (mental health, social connection, inclusivity, equity) as considerations, but for these benefits to be centred as the drivers for design. Long term, it aims to support a step-change towards a new urban paradigm that systemically maximises human health and social wellbeing.

Matthias Gruber

Dr Gruber is a Sir Henry Dale Fellow funded by Wellcome and the Head of the Motivation and Memory Group at the Cardiff University Brain Research Imaging Centre (CUBRIC). His research focuses on the cognitive and neural mechanisms underlying curiosity, and how curiosity affects learning, information seeking, exploration, and memory.

Curiosity shapes how we explore and learn about environments

Novel environments stimulate intrinsic curiosity to explore unknown places. However, it remains untested how curiosity shapes aspects of spatial exploration. Combining a novel virtual reality task with measures of exploration complexity, we found that pre-exploration curiosity states predicted how much individuals spatially explored environments, whereas markers of visual exploration determined post-exploration feelings of interest. Furthermore, both curiosity and exploration predicted the precision of participants' memory about the environments. These results provide new evidence for a link between curiosity and exploratory behaviour, and how curiosity might shape memory formation.