6 Summary of the Webinar Presentation

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Hosted by: Spatial Analysis and Simulation Lab/Community (SASL)
Title: **Trends in Building Performance Research: Pathways and Postgraduate Opportunities**

Introduction

Spatial Analysis and Simulation Lab/Community (SASL) hosted its sixth webinar, focusing on advancements in sustainable building performance and postgraduate research pathways. The keynote speaker, Dr. Sahar Abdelwahid, shared her expertise in sustainable architecture, building performance, and user-centered design. This report synthesizes the webinar's key discussions, emphasizing research insights, experimental findings, and postgraduate opportunities.

Opening Remarks and Contextual Framework

Dr. Randa Khalil began the session by introducing SASL's scope and focus on architectural and urban research, integrating simulations, spatial analysis, and other emerging technologies. She emphasized the lab's commitment to interdisciplinary research, which aligns closely with biophilic concepts.

Dr. Sahar Abdelwahab has a distinguished academic and research profile. She obtained her PhD jointly from Al-Azhar University, Egypt, and the University of Nottingham, UK, focusing on building performance and sustainable building design. Her academic journey includes a Fulbright award for a development program in Texas, USA, and postdoctoral research at KU Leuven in Belgium. She is a senior lecturer at De Montfort University, UK, where she continues her work on sustainable architecture, emphasizing energy performance, daylight optimization, and user comfort. Her contributions to the field have earned her numerous accolades, including the Climate Innovation Award from the DMU United Nations Hub.

Research Insights

Dr. Sahar elaborated on her research focus areas, methodologies, and findings, emphasizing the importance of integrating sustainability and human factors into building design:

Focus on Sustainable Design: The research addresses the role of daylight as a sustainable light and energy source. Optimizing daylight performance enhances building energy efficiency and supports occupant well-being.

Electrochromic Glazing Systems: The study investigated smart glazing technologies, specifically electrochromic glazing, which dynamically adjusts its visible transmittance to control daylight and heat transfer. This technology offers energy-saving benefits while raising questions about its impact on occupant perception and satisfaction.

Human-Centric Design: Moving beyond physical performance metrics, Dr. Sahar emphasized user interaction and comfort, highlighting how indoor environmental quality—light, air, and thermal comfort—profoundly impacts occupant health, productivity, and satisfaction.

Research Methodology

The research adopted a controlled experimental approach to evaluate electrochromic glazing systems. A dedicated test room equipped with electrochromic glazing at varying visible transmittance levels (2% to 65%) served as the experimental environment. Key components of the methodology included:

- Controlled scenarios simulating clear, tinted, and mixed-glazing configurations.
- Visual task performance evaluations, including color-naming accuracy and visual acuity tests.
- Self-reported questionnaires assessing participants' perceptions of light quality, color accuracy, and visual comfort.
- Participants can adjust glazing settings to their preferences, enabling insights into user choices and satisfaction.

Research Findings

Dr. Sahar presented the study's key outcomes, revealing the nuanced impacts of electrochromic glazing on building performance and user experience:

- **Visual Task Performance**: While tinted glazing altered spectral light composition, the variations did not significantly impact participants' visual task accuracy.
- **User Satisfaction**: Mixed glazing configurations, such as fully tinted upper panels combined with clear lower panels, improved occupant satisfaction by balancing daylight control and natural light quality.
- **Glare Perception**: Participants reported glare discomfort under specific tinted scenarios, even with reduced daylight levels, suggesting a need to explore human sensitivity to light wavelengths.

Postgraduate and Postdoctoral Opportunities

Dr. Sahar concluded with a discussion on competitive research opportunities in the UK:

- Master's Scholarships: Programs like Chevening and the British Council Women in STEM initiative provide funding for international students, emphasizing preparation and strong research proposals.
- PhD Pathways: Opportunities exist through university websites, job boards like jobs.ac.uk, and collaborative international PhD schemes.
- Postdoctoral Research: Platforms like the British Council's ISPF and European programs like Marie Skłodowska-Curie Fellowships enable international researchers to collaborate.

Key Takeaways

- Sustainable architecture must balance technical performance and human-centric factors.
- Electrochromic glazing offers energy-saving benefits but requires refinement to address occupant comfort challenges.
- Postgraduate applicants should focus on publishing, research proposals, and collaboration.
- AI has transformative potential in modeling and optimizing user-centric building performance.
- Research outcomes can effectively inform industry practices and policymaking.

The webinar highlighted the interplay between technical innovation and human-centric design in sustainable architecture. Dr. Sahar's research demonstrated the potential of smart glazing technologies to improve energy efficiency while addressing user perception and comfort challenges. Her insights into postgraduate research pathways also provided valuable guidance for aspiring scholars.

Q&A Session

Q1: What skills are essential for postgraduate applications?

- Dr. Sahar emphasized the importance of developing a well-articulated research proposal, gaining publication experience, and showcasing passion for the chosen field. Engagement in collaborative projects further strengthens applications.

Q2: How can AI enhance building performance research?

- Advanced AI-based computational tools can model and predict user behavior, contributing to innovative, user-centric architectural designs.

Q3: Why is building performance via simulation often debated?

- Simulations focus on physical parameters but may overlook psychological and physiological responses, critical in occupant comfort and behavior.

Q4: How can sustainable architecture research engage policymakers?

- By highlighting energy savings, carbon reduction, and occupant well-being, researchers can effectively advocate for policies supporting sustainable building initiatives.

Q5: How did industrial partners react to research findings?

- Industry partners valued the insights on user perception and comfort, which informed potential advancements in glazing technology. Ongoing research continues to bridge the gap between academic findings and practical applications.

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