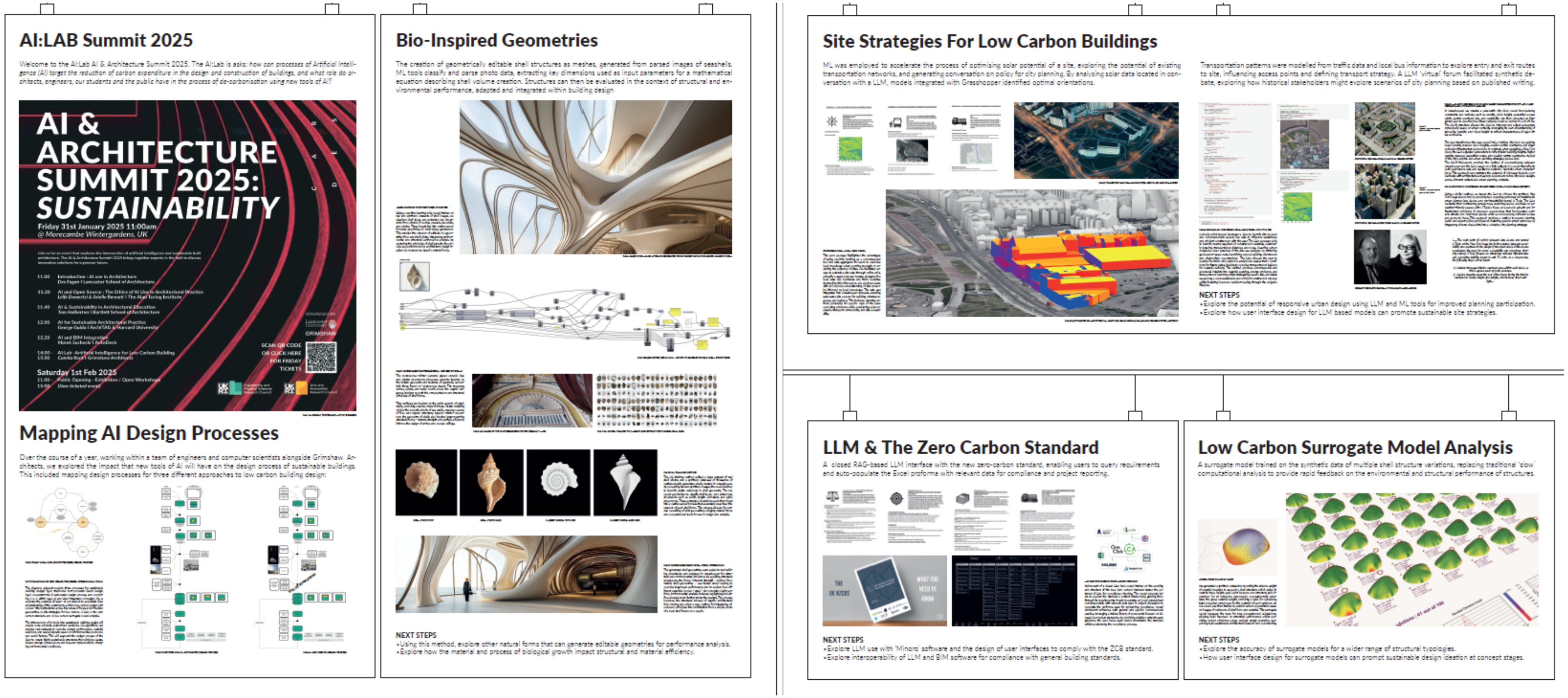
Ai:Lab
Artificial Intelligence for Low cArbon Building




AI:LAB Summit 2025
AI & ARCHITECTURE SUMMIT 2025: SUSTAINABILITY
Mapping AI Design Processes
Bio-Inspired Optimised Geometries
GRIMSHAW
Site Strategies For Low Carbon Buildings
Experiments
ai assistants
Outcome 3

Forma Quick visual design exploration
Customers can leverage the power of natural language prompts and LLMs to create visual rendering options for their site studies.
Approach Generative AI
Why it matters? Leverages third party generative models to help customers visualize their designs using their own words.
Third-party Integration (Veras)
Bio-Inspired Optimised Geometries
Site Strategies For Low Carbon Buildings
Experiments
LLM & The Zero Carbon Standard


Process
attendee selects a shell and takes a photo
e is uploaded and the ML based model
Process
Shell Generation - Patterns and Structures using
Exhibit Process
Users select from approximately 20 shell types
A camera is set up with ability to take photos.
This is fed into the computer vision ML model
a) define type (cockle / sea snail / whelk)
b) define generative dimensions
Characteristic radius / Coefficient of size section
Number of sections per turn / Ratio length/radiu
machine learning model to beg
then input into the Grasshoppe
n to pass data from images to
model which
Carbon mimicking principles of design based on an organism
biomimetics, biomimicry
Engineering and Physical Sciences Research Council
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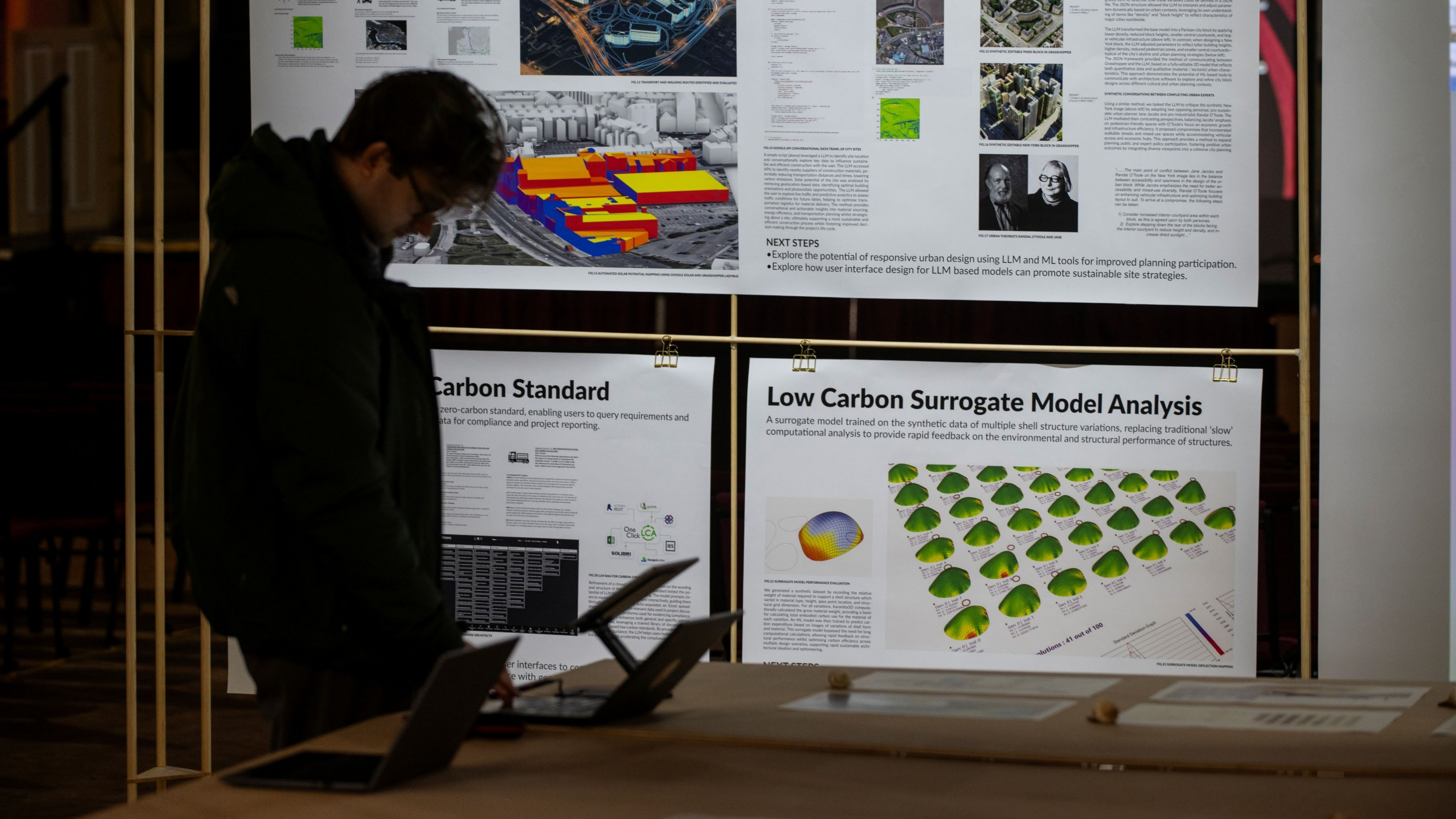
NEXT STEPS
• Explore the potential of responsive urban design using LLM and ML tools for improved planning participation.
• Explore how user interface design for LLM based models can promote sustainable site strategies.
Carbon Standard
zero-carbon standard, enabling users to query requirements and
ata for compliance and project reporting.
Low Carbon Surrogate Model Analysis
A surrogate model trained on the synthetic data of multiple shell structure variations, replacing traditional 'slow' computational analysis to provide rapid feedback on the environmental and structural performance of structures.