Aileen Iverson-Radtke

Post-doc

Iverson-Radtke, Aileen, Architect and PhD, is a Berlin researcher and founder of ai-r_architecture. She was Adjunct Prof. at NYIT and AiNYC. Currently she advises PhD students and conducts workshops and lectures on her novel research ‘cybermodeling’. Workshop venues include MIT and ACADIA, publications and lectures include Dimensions Journal and conferences: eCAADe, ACADIA, EAAE/ARCC and IASS.

Artefact: the DISPOSITION of Cybermodeling

This proposal is for a CA²RE alumni presentation/ demonstration of Cybermodeling, a novel digital modeling interface developed through Design Driven Doctoral Research (DDDR) completed in 2022. Currently, this research is being advanced in workshops at leading universities and conferences in the field of digital design. The purpose of the presentation is to inspire by showcasing post-doctoral research progress and innovations.

The research seeks to broaden current digital design methods, offering Cybermodeling as a multi-beneficial tool: directly linking digital modeling to real-time site conditions while providing haptic interface to improve sensory understanding of digitally designed objects. Addressing this presentation to the CA²RE Beograd panel aims to examine the value of Cybermodeling methodology in architectural pedagogy, and best strategies for integrating this approach in school curricula.

Short Reflection

As an experienced architect, I returned to academia to explore a question central to my practice: how to improve digital modeling as a tool for critical thought. The DDDR format was crucial, as my question involved modeling, reflecting, and critique—all methodologies familiar to architectural practice.

Early on it was determined that the best way to examine the ability of physical and digital modeling to support thought process, was by combining them into a uniform hybrid analogue-digital modeling engagement (Image 1-3). The substantial role of electronics and micro-sensors/ controllers in connecting analogue-digital modalities gave rise to the name Cybermodeling[1].

The architectural discipline uses making as a means of analysis the way other disciplines use writing, solving equations, or formulating graphs. The important difference between conducting analysis through making is that it engages media with properties and tendencies that 'interfere' and significantly influence analysis. Moreover in modeling, media interference is specifically architectural, as it is generated by spatial-material relationships. The research identifies design media in which material properties are connected and reacting to a spatial context of forces and atmospheres as spatiomaterial[2] media. This spatiomaterial quality animates design media, giving it agency to 'interfere', respond, and generate feedback during design process making. The purpose of Cybermodeling is to facilitate digital spatiomateriality by (re)connecting digital media to spatial context.

The current post-doctoral goal is to distribute Cybermodeling methodology within architectural practice and pedagogy through workshops, lectures, and publications. The workshop format is of particular interest as heuristic platform (Images 4, 5) encouraging adoption while developing the methodology through the expertise of participants/ digital design practitioners (Image 6).

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[1] *"… cyber … generically and universally adopted in popular culture to evoke almost anything related to electronics and computers … a moniker for any technologically mediated alternative to physical space"* ' In Carpo, Mario (2023). 'Digitally Intelligent Architecture Has Little To Do With Computers (And Even Less With Their Intelligence)', ARQ113, Santiago, Chile, Conditions for Change: 19-31. https://www.scielo.cl/pdf/arq/n113/en_0717-6996-arq-113-18.pdf (Accessed on 8 Jan. 2024)

[2] Refers to the inherent connection and interactions of physical spatial and material properties which create a third, *spatiomaterial* state of media which is active and animated due to these interactions. Iverson-Radtke, A. (2022). *rabbithole to hybrid: Finding Digital Spatiomateriality Through Hybrid Modeling* [Doctoral Dissertation, Technical University of Berlin]. Germany. DOI: 10.14279/depositonce-15983, https://depositonce.tuberlin.de/handle/11303/17204

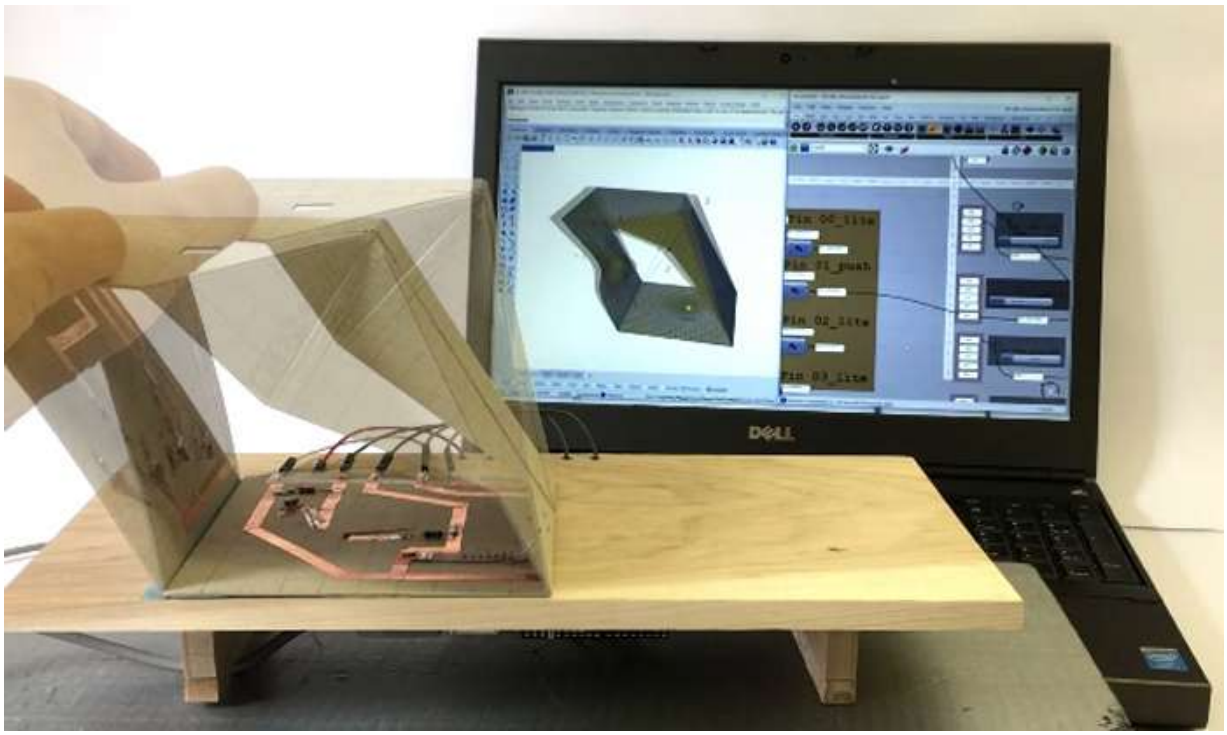


Image 1: Case Study o2, cybermodeling interface

Rapid advances in AI and automated digital manufacturing compel us to take a position with regard to the computational and its role in how we examine, operate—thereby understand and design solutions to ongoing urgent sociopolitical and climate challenges.

Cybermodeling utilizes microsensors to link digital modeling with site-specific conditions and human sensory access. The methodology operates through an analog smart model interface to relay environmental data (humidity, turbulence, light, etc.) directly to digital materials.

What happens next is unexpected and astonishing!

Linking dynamic real-time environmental inputs creates 'live' digital models that interact and adapt to their surroundings, engaging designers in the process. Cybermodeling allows us to model digitally with local site conditions and the design object's material qualities. This leads to design solutions integral to the dynamic ecologies of which they are part.

The disposition of Cybermodeling is

(in) op-position:	to autonomous or automated design, thus facilitates human corporeal intelligence in digital making; to notions of the superior complexity of computational over the natural, thus cultivating spatiomaterial interactions in computational making
com-position:	of design objects that are simultaneously physical and computational
trans-position:	of physical material logic into computational systems and visa-versa, exporting computational material logic in physical making; of human corporeal intelligence in computational environments
juxta-position:	of physical and digital material behaviors, as catalyst for composing computational materials as non-neutral, spatiomaterial media with agency, thus
decom-position:	and gradual erosion of the view of hylomorphic computational design

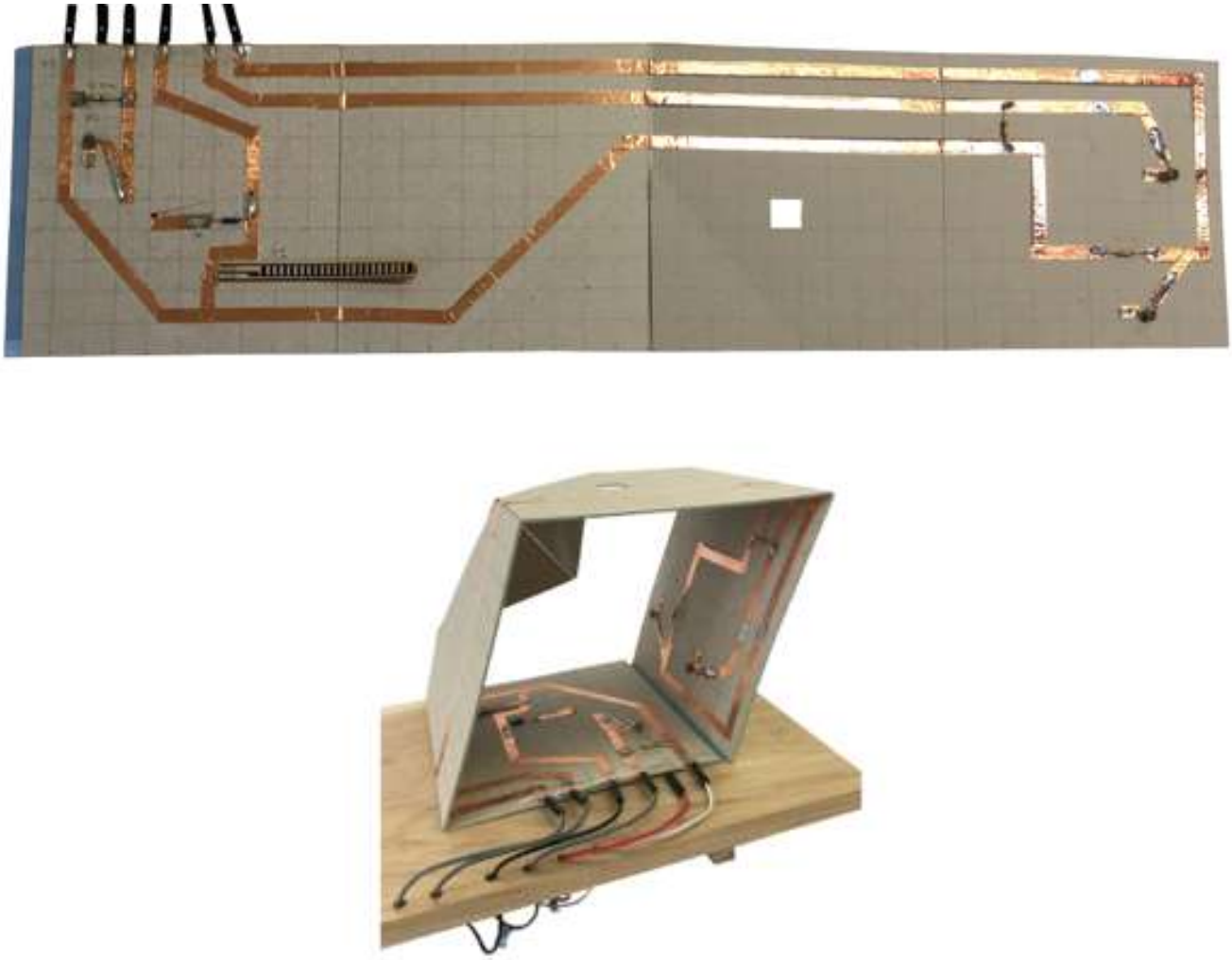
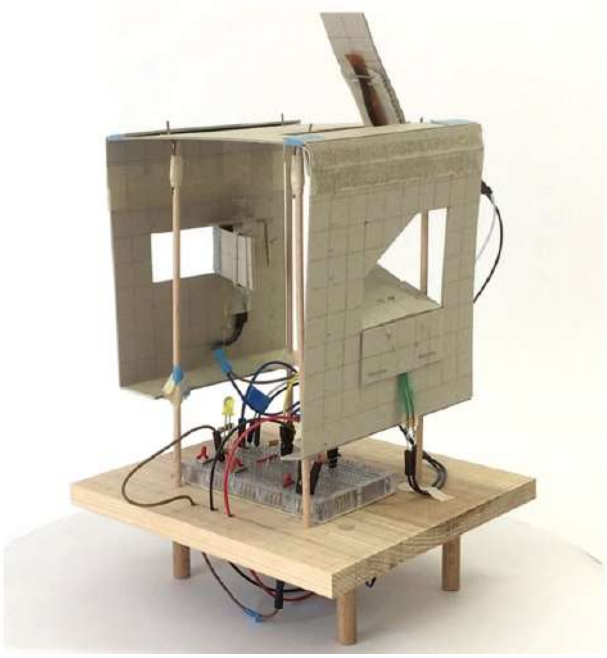
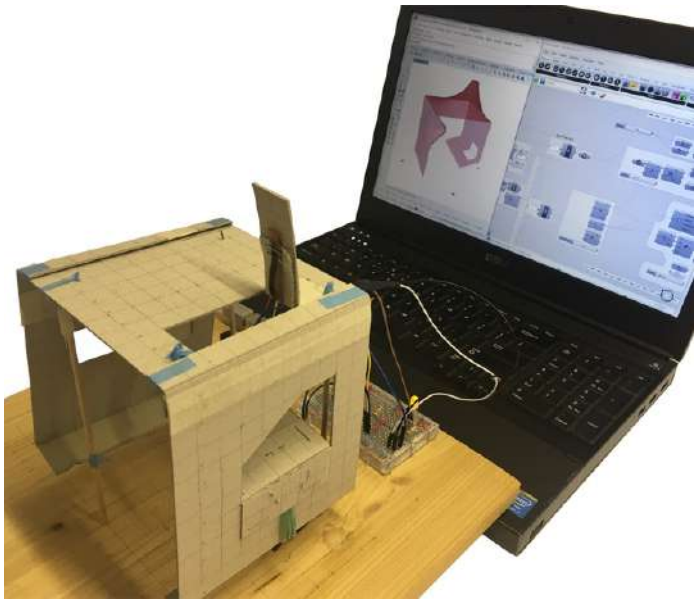


Image 2: Case Study o2, analogue ‘smart’ model (above and middle), as interface to cybermodeling (below)





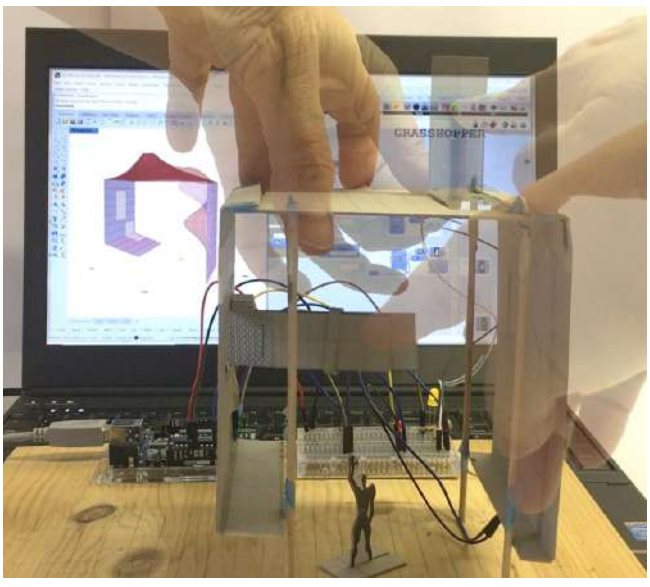


Image 3: Case Study o5, analogue ‘smart’ model (above), set-up (middle), cybermodeling interface (below)

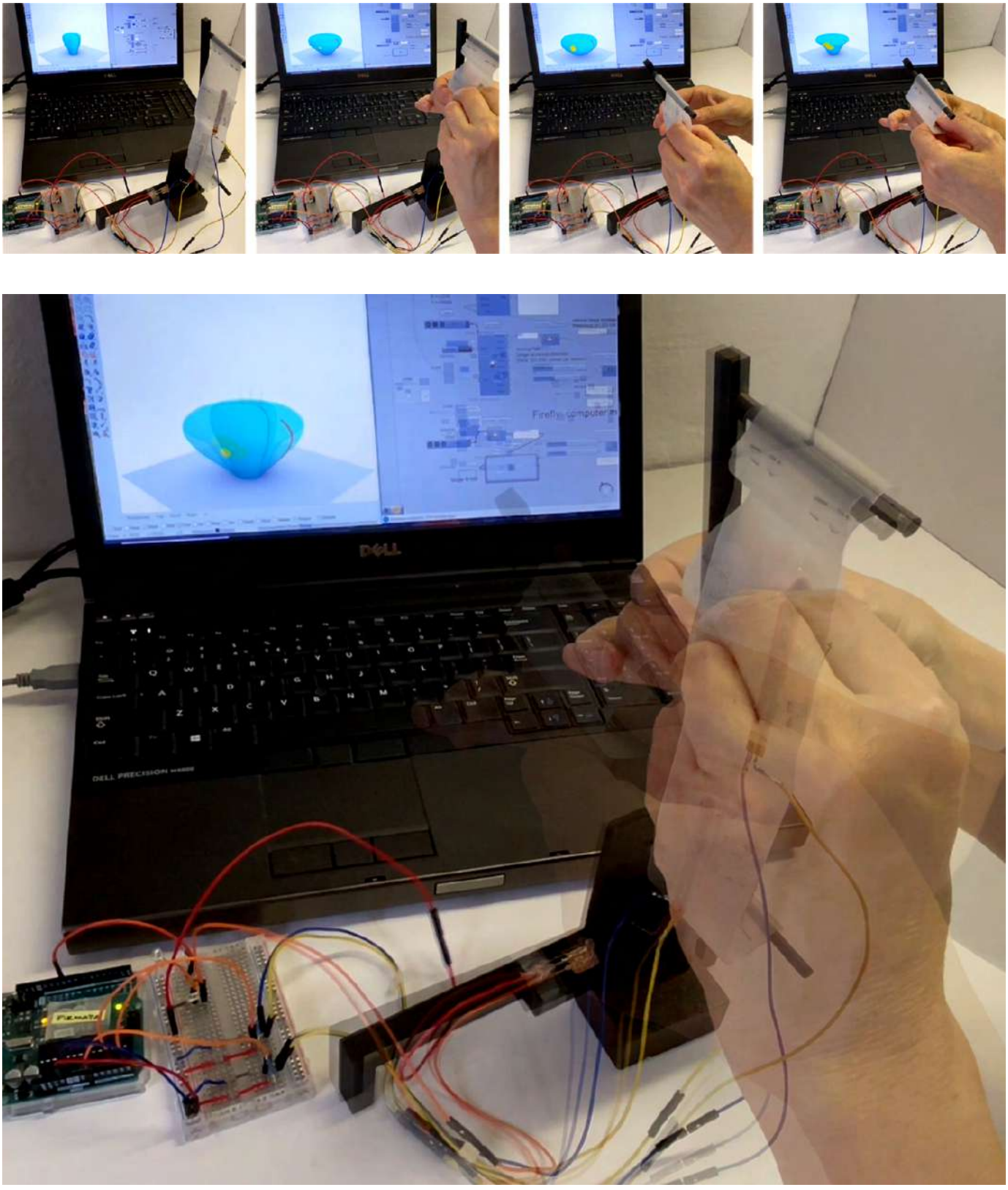
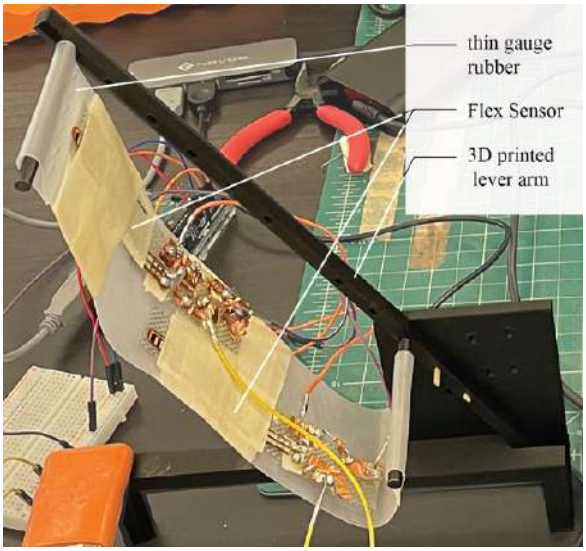
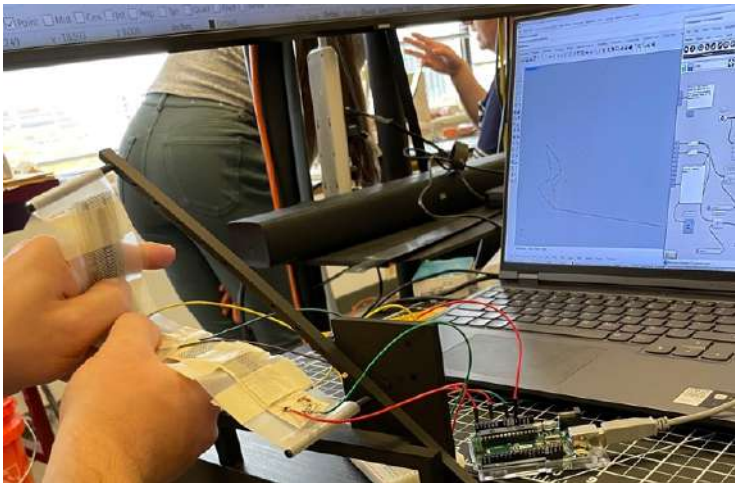
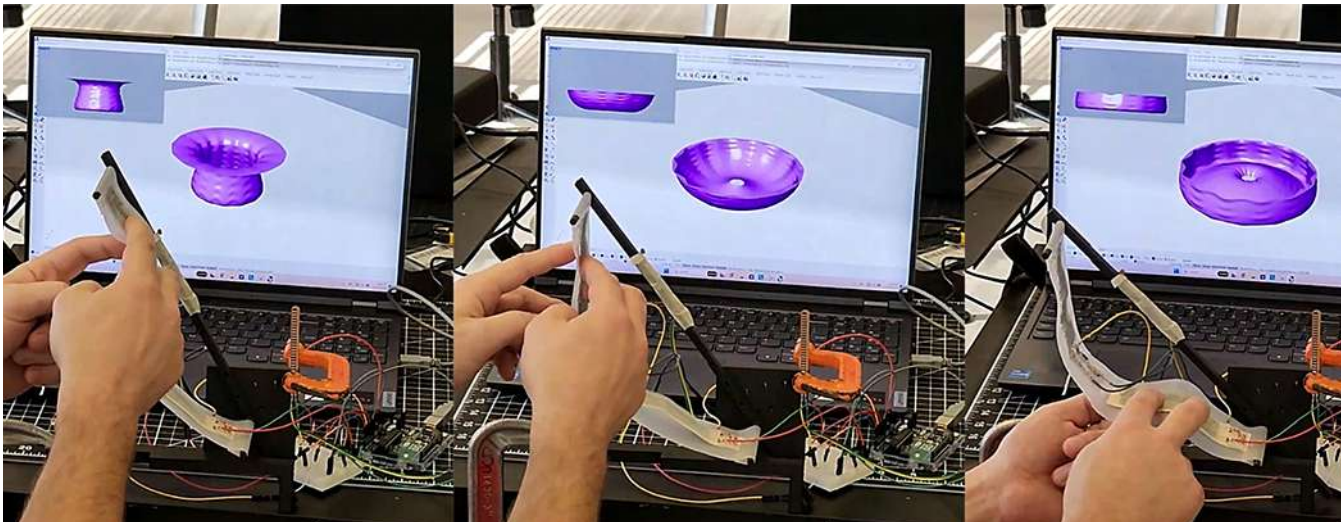


Image 4: workshop cybermodeling interface – ‘Rubber Vase Project’







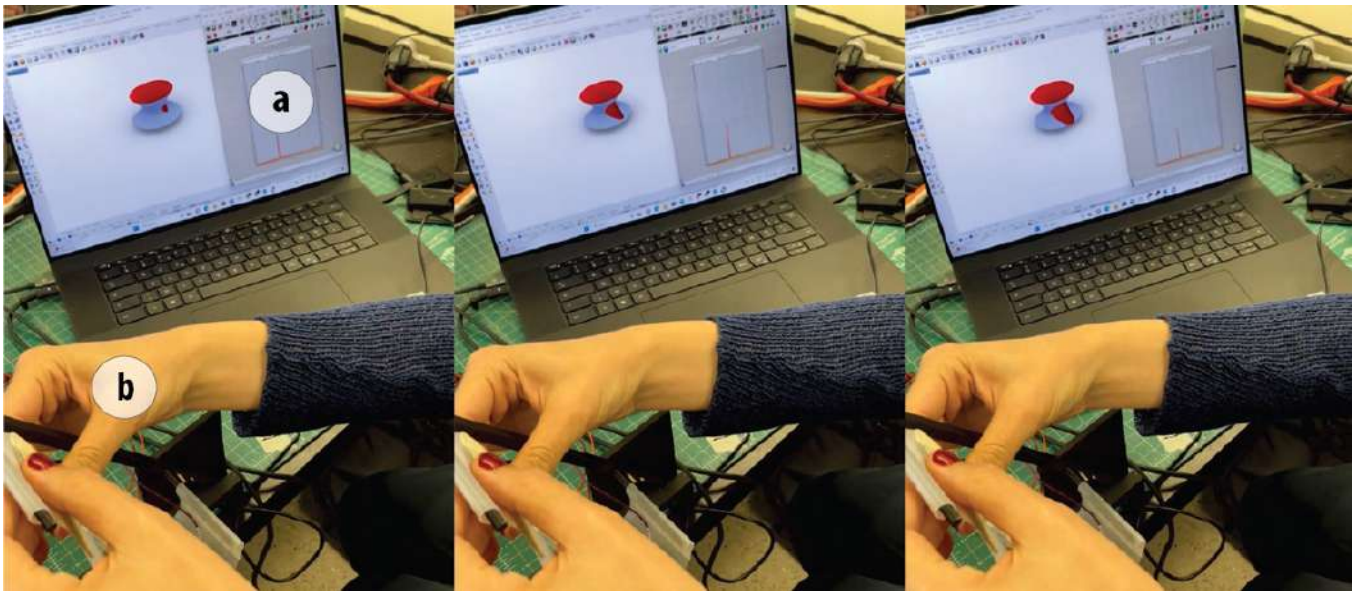


Image 5: (above left) analogue ‘smart’ model components (above right) transfer manual manipulations and contextual data to inform digital modeling; (below) modeling a digital ‘Rubber Vase’ using sensor data detecting light, sound, and manual forming of the analogue model interface

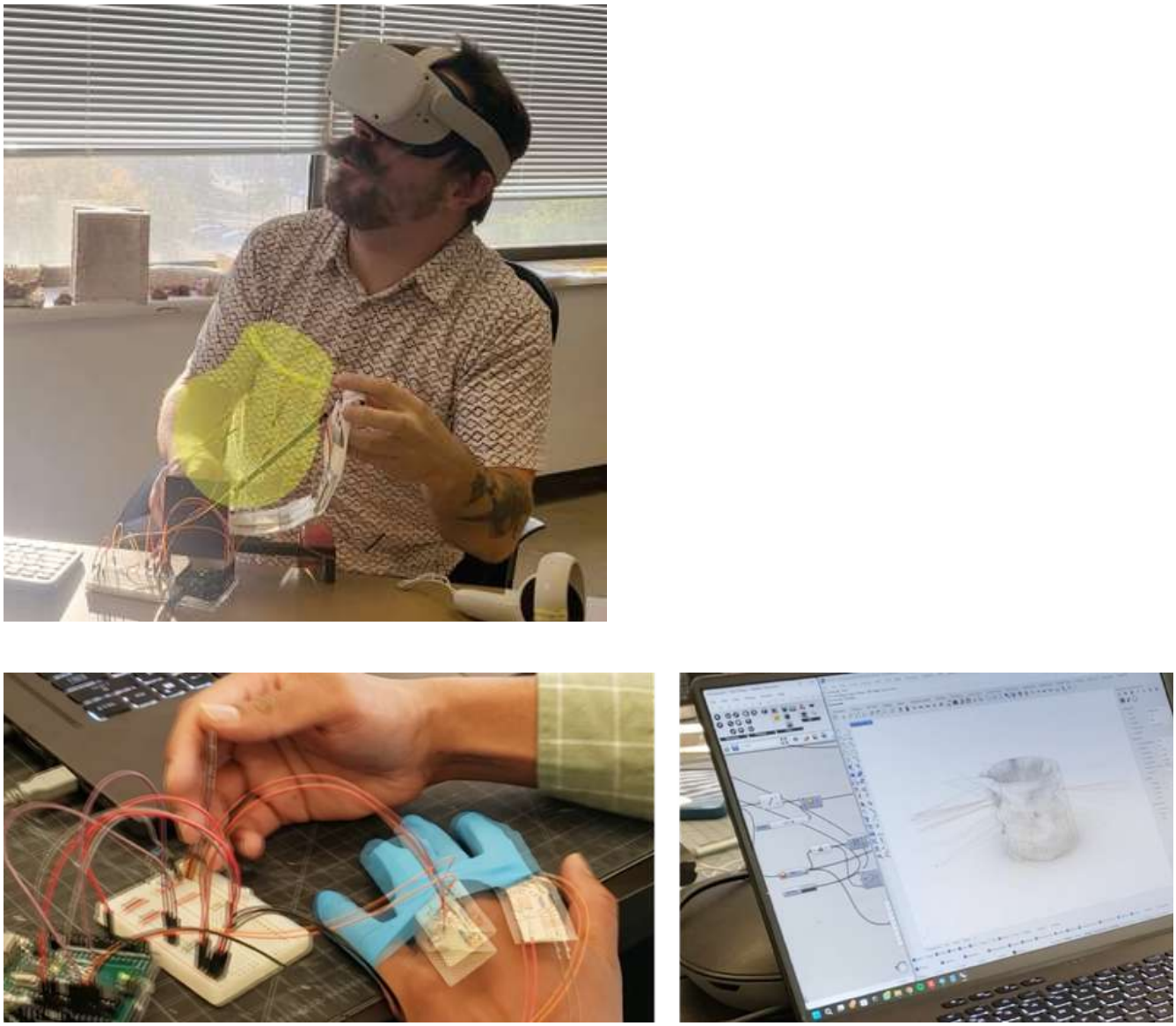


Image 6: additions to the cybermodeling interface contributed by workshop participants digital design expertise (above) AR equipment experience, (below) D.I.Y. VR glove