

AUGMENTED DESIGN & DIGITAL MANUFACTURING CENTRE

DELFT DESIGN LABS^{PLUS}

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DESIGN
FOR OUR
FUTURE

WHY AN AUGMENTED DESIGN & DIGITAL MANUFACTURING CENTRE ? TO MAKE IDE STAND OUT IN HUMAN-CENTRED DIGITAL MANUFACTURING!

We believe that new developments in digital design and digital manufacturing will change the way we design, and will revolutionize the way organisations create value. Combining computational power and biodynamic models with human skills/intuition during design, yield personalised solutions. Blending bits, atoms and electrons open up new opportunities for (connected) products with embedded electronics and their digital representation in the cloud (digital twin).

To become a thought leader in this field, we need an integrated approach, bridging new design tools and methodologies, new production techniques, user characteristics, and future business dynamics. These knowledge domains are already present at IDE, however organised in silos. We believe that with an integrated approach, we can bring ourselves to the next level and build a strong differentiator in the increasingly crowded

HOW? BUILDING DEMONSTRATORS IN AN AGILE, MULTIDISCIPLINARY APPROACH THAT COMBINES RESEARCH & REAL-WORLD APPLICATIONS

DE, PIM and ID will work closely together in this new design centre, combining research and practical applications. Students*, design teachers, and researchers are engaged through courses like ACD, AED, minor on advanced prototyping and a new elective "prototyping lab". We will specifically include:



DYNAMIC ANTHROPOOMETRY: deep understanding of physical human characteristics/activities and how to create the perfect fit. This starts with opening up 3D/4D scanning infrastructure for the design centre.



AUGMENTING FABRICATION: the creation of custom digital manufacturing systems where computational power is combined with human skills/intuition.



3D-PRINTED ELECTRONICS: blending functions and materials in new products enable smart dynamic behavior. From technology-based wearables to tech-infused fashion as the natural human interface.



DESIGNERLY BUSINESS MODELS for digital manufacturing, building on agile and iterative development methods.

*we will attract master students that want to become "Advanced production designer" or "Personal value designer". In follow-up projects, when we work on scaling initiatives together with industry, we will work with the "Intelligent interactive system designer" and "Critical mass designer".

WHAT? A VARIETY OF INNOVATIVE PROTOTYPES & DEMONSTRATORS

Projects will centre around creating demonstrators that:

- host a design-driven approach,
- represent a radical innovation,
- appeal to a large audience (academic, industry and the general public).

Through our projects, we will prove the value of designers to other disciplines (mechanical engineers, archaeologists, cardiologists, etc.) and create highly visible deliverables. Besides sound academic publications, this will yield a reputation and presence at exhibits, networking meetings and colloquia and will present opportunities for media exposure (like the 3D printed bicycle).

Real-world applications are crucial for success; therefore, future projects will be defined together with external stakeholders. The first initiatives will cover:



Printed electronics in medical purposes:
e.g. a sticker that calculates and displays the expiry date.



Augmented design for digital fabrication for complex designs



Opensourced digital knitting machine for personalised garments (e.g. knee support)



Advanced 3D scanning such as the 3D hand scanner projects

To kickstart this, we host current visiting professor Joris van Tubergen and research fellow Nicola d'Apuzzo (Milano). We also expect to host masterclasses from fashion designers such as Iris van Herpen and Vera de Pont.

BENEFITS

- ✓ Develop new expertise, knowledge and skills in augmented design and manufacturing. Build new
- ✓ expertise in agile design processes.
- ✓ Demonstrators generate PR and media exposure.
- ✓ Opportunity to attract external research grants and donations.