



BLUEPRINTS OF HOPE: THE 3D PATH TO PERSONALIZED PROSTHETICS

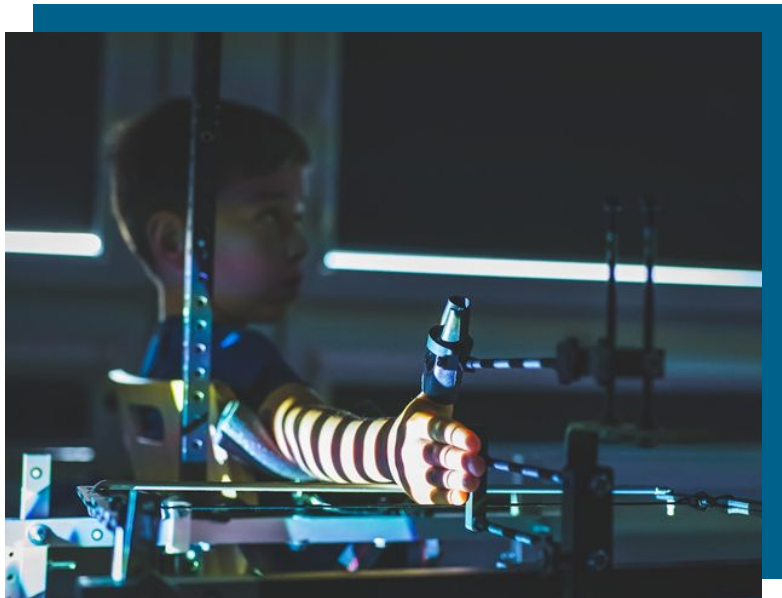


**FOR WHOM DO
WE DESIGN?**



- Biologically disabled people constitute **more than 10%** of the population in Poland.
- The overall number of disabled people is decreasing (2002 vs. 2011, GUS data), BUT the **number of biologically disabled people is increasing!**
- Causes: aging society, civilization diseases, accidents.

THE FUTURE IS HERE!



A modern digital process and 3D printing are replacing the traditional molding of prostheses and orthoses for people with mobility impairments

DAY 1
3D SCANNING

DAY 2
RAPID MANUFACTURING

DAY 3
FINAL PRODUCT



THE FUTURE IS HERE!



3D Printing: Unlocking New Technical Possibilities + Potentially Low Cost

DAY 1
3D SCANNING

DAY 2
RAPID MANUFACTURING

DAY 3
FINAL PRODUCT

THE FUTURE IS HERE!



Challenge: Engineers Needed for Product Design!

DAY 1
3D SCANNING

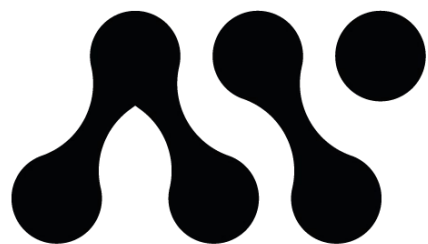
DAY 2
RAPID MANUFACTURING

DAY 3
FINAL PRODUCT

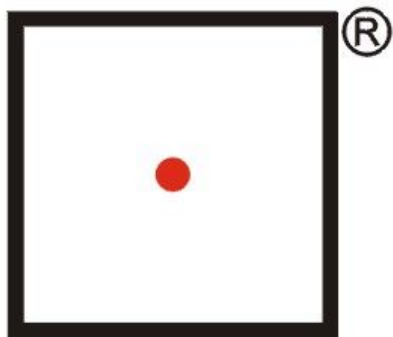


NEEDS AND PROBLEMS

- The costs of **professional prostheses** are **very high** (>10k PLN), with a **long preparation time**.
- Without a prosthesis - spinal curvature, **lack of function**.
- **Limited offer** for amputations **above the elbow**.
- Limited offer of **utility prostheses** (cycling).



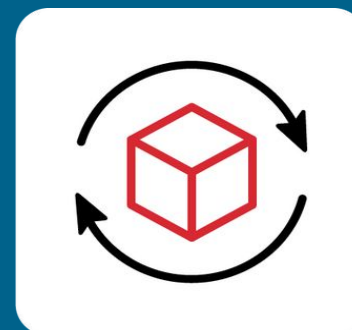
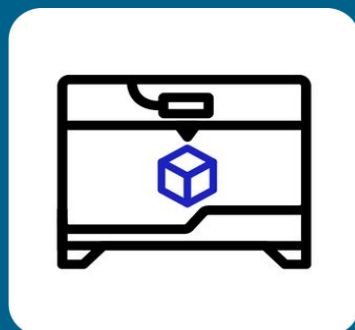
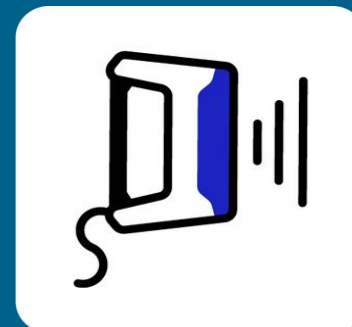
AutoMedPrint

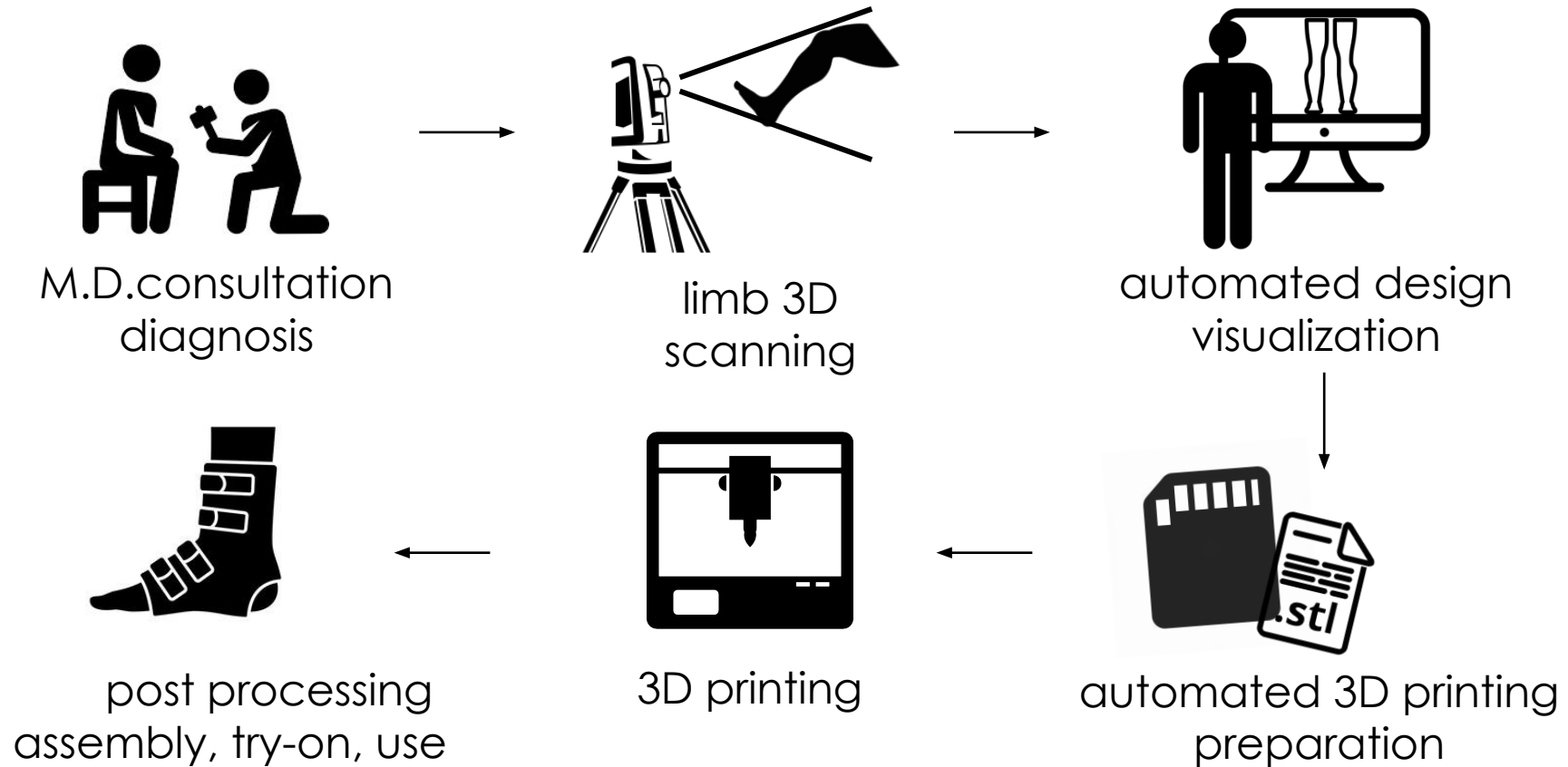


**Polski
Produkt
Przyszłości**



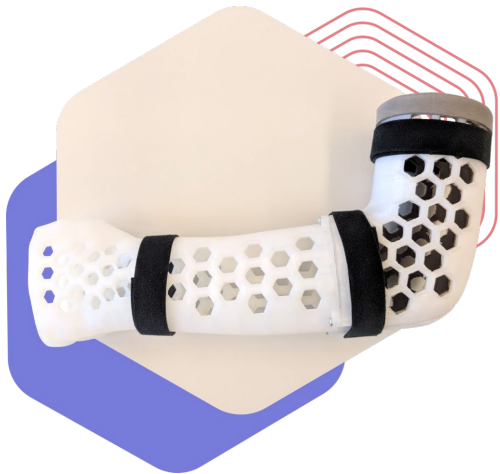
POZNAŃ UNIVERSITY OF TECHNOLOGY



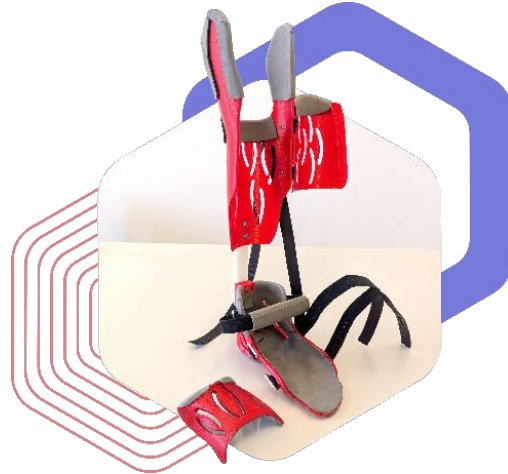


AUTOMEDPRINT: Automation of design and rapid manufacturing of individualized orthopedic and prosthetic supplies based on data from anthropometric measurements

ORTHOPEDIC PRODUCTS



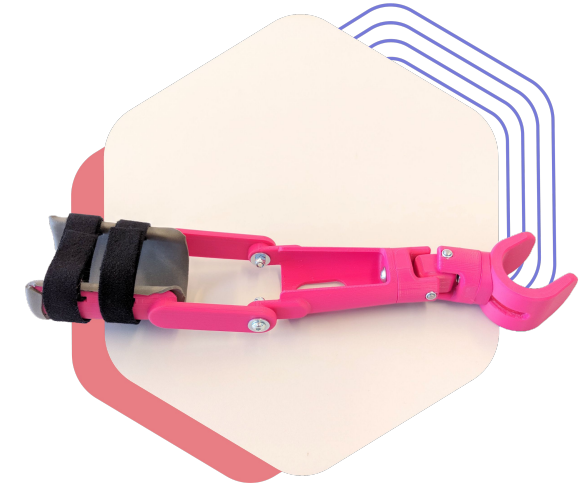
HAND
ORTHOSES



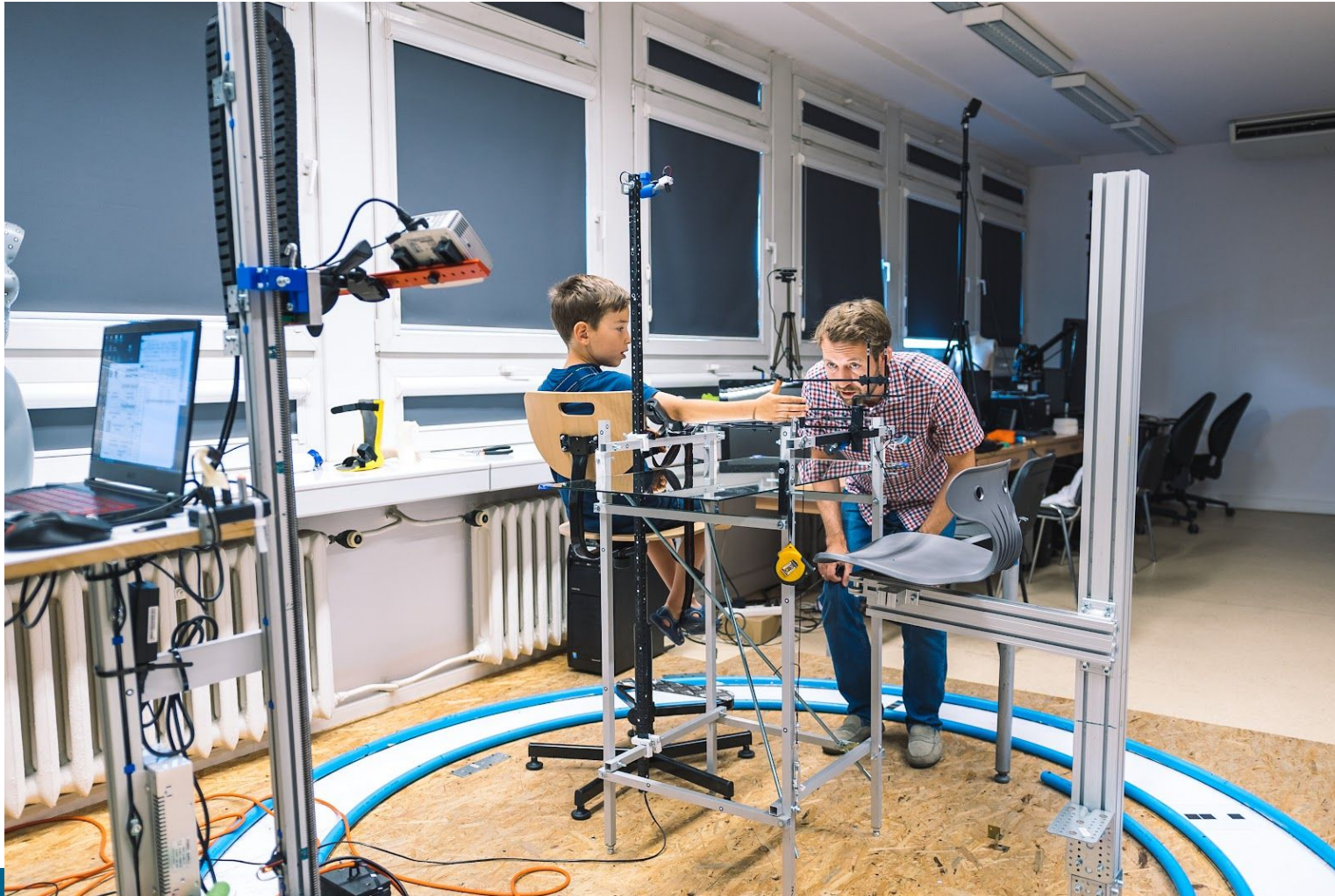
LEG
ORTHOSES



COSMETIC
PROSTHESES



MECHANICAL
PROSTHESES

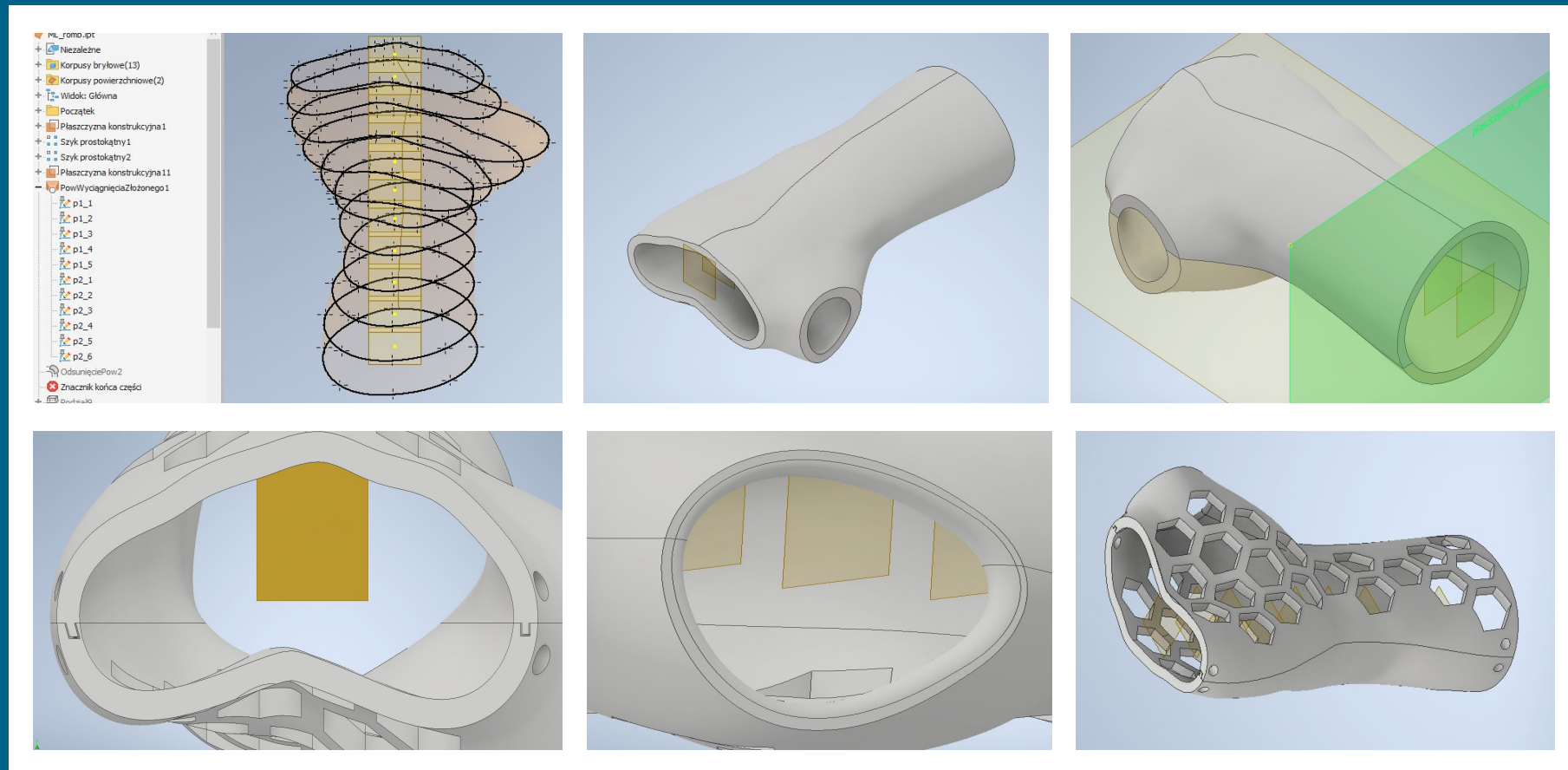


3D SCANNING



3D SCANNING

AUTOMATED DESIGNING PROCESS

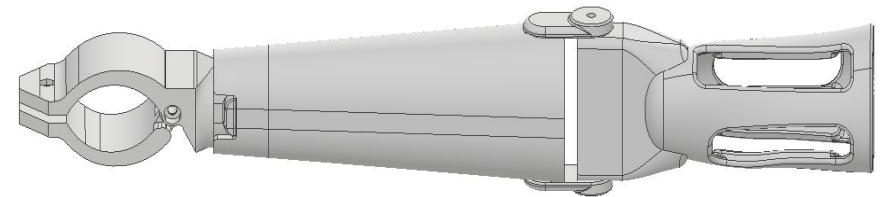
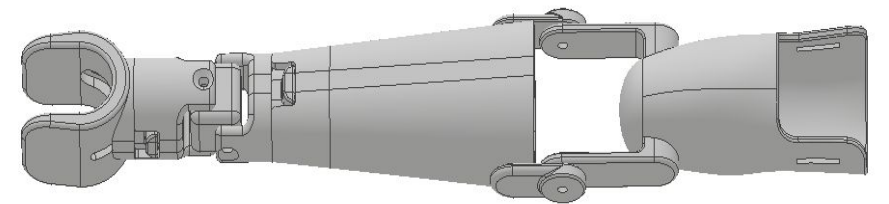
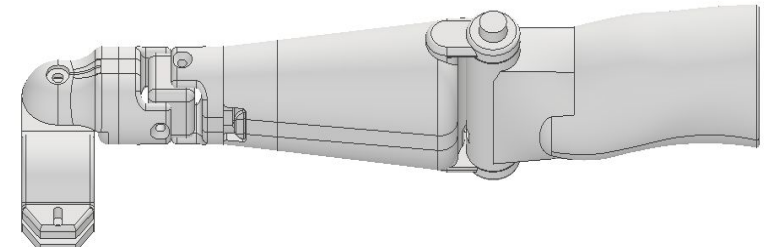
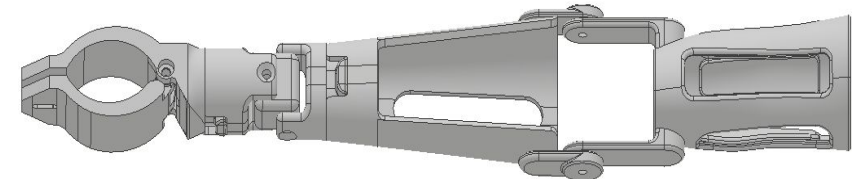




CUSTOMIZATION OF A PRODUCT

MODULAR AUTOMATION

- **Intelligent CAD** models
- Free **exchange of variants** for a single patient (prosthesis modules)
- Substitution of data from 3D scans for **different patients**
- Time to generate a variant: **5 minutes**





RAPID MANUFACTURING



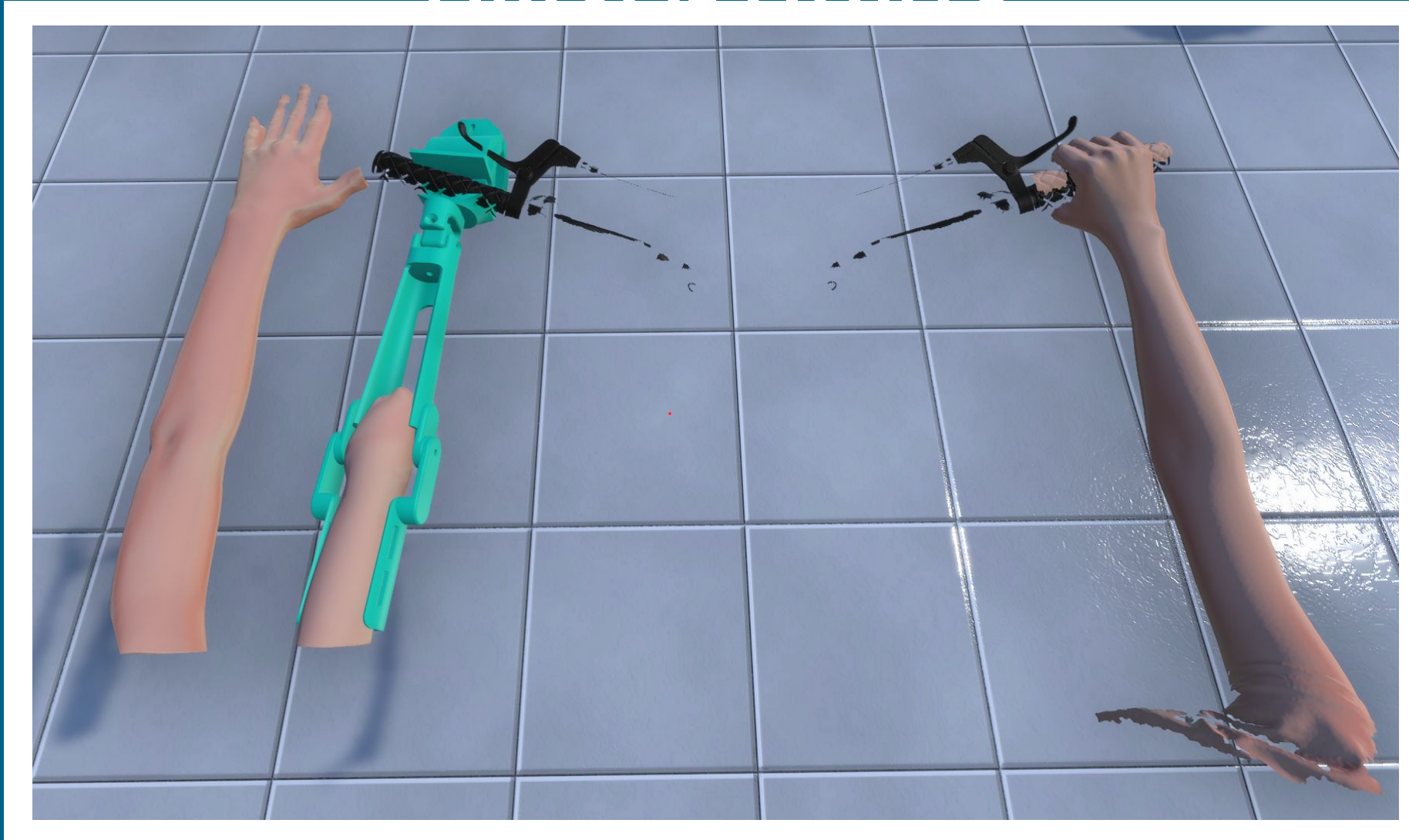
- **Low-cost** and **simple FDM** technology – can be used for printing even at home
- **Ecological** and **biocompatible materials** like PLA, nylon, or thermoplastic polyurethane
- Ability to **control the weight** of the prosthesis and 'slimming down'
- Complete prosthetic for a child – printed in **less than 24 hours**

TESTING PRODUCTS BY PATIENTS





VIRTUAL FITTING



FINAL RESULTS



MACIEJ



KUBA



MAJA



MIŁOSZ

FINAL RESULTS



KAROLINA



LEOŚ



ZUZIA



LEOŚ



SUMMARY

3D printing and digital design has enormous **potential in medicine and biomedical engineering** – that is not yet fully used

approach to each patient - **individual** but a lot of the work **can be automated**

cooperation of doctors and engineers can improve or even save someone's life

3D printers in hospitals will be more and more popular and **3D printing** will likely become one of the **essential elements** in preparation for surgery

FOUNDED: 1992
ELECTED TO CAETS: 2023

Akademia Inżynierska w Polsce
Academy of Engineering in Poland





SEARCH ON THE WEBSITE

Search...



NO CATEGORY

COMMUNICATION PRIZE competition

ADRIAN SMAGÓR FEBRUARY 22, 2024

Films submitted to the CAETS competition

Implants:

<https://www.youtube.com/watch?v=IJYRpFzIM60>

Blueprints of Hope:

[Blueprints of Hope_ The 3D Path to Personalized Prosthetics.mp4](#)

RDE technology:

[RDE technology developed by Łukasiewicz – Institute of Aviation.mp4](#)

Assessment protocol:

[Protokol_CETS-Communication-Prize-2024](#)

Warsaw, January 12, 2024

Announcement on the COMMUNICATION PRIZE competition announced by the International Council of Engineering Academies CAETS

Similarly to the previous years, CAETS announced a competition for the best short (up to 5 minutes) video in English presenting modern engineering technologies to a wide audience in terms of their benefits for the economy and society. For the first time, the Polish Academy of Engineering can

organizacja
pożytku publicznego

opp

1,5%

Medal im. Gabriela Narutowicza



LATEST

Newsletter No. 8(48)

Prof. Agnieszka Sol
appointed to the Sc
Committee

AIP member Weron
obtained her habili

New authorities of
Rectors of Polish Te
were elected

Vice-President of A
Skoczypiec is the c
Production Enginee
the Polish Academy

XLIII Zgrom
Ogóln





THANK YOU