

MASS-CUSTOMIZATION IN THE FIELD OF ASSISTIVE TECHNOLOGY

Development of an autonomous anatomic seating system,
customized to the clinical and functional needs of users.

Alexander Geht
Cofounder abililab
custom made solutions
Haifa, Israel
alexgeht@gmail.com

ABSTRACT:

Assistive Technologies are specialized products aiming to partly compensate for the loss of autonomy experienced by disabled people¹. Earlier studies suggested that proper seated position is the main goal to normalize the muscular tone, improving the optimal function². Additionally, proposed that adaptive equipment which is provided to CP children should be customized individually according to the child's functional and contextual needs³.

Mass-production assistive-technologies, usually designed, general and adjustable, to fit the large market as possible. As a result, off-the-shelf products are too general and did not fit the individual need. Custom-made products fit precisely to the need of the individual, by being design accurately for the body measures and personal needs. There is a fundamental need for custom products, whether, for luxury fields such as sports, military, or space, where optimal performance is essential. But moreover for disabilities field, where custom solutions are critical to assist in activities of daily living (ADL) and rehabilitation. However, custom made products are expensive and not achievable in most cases. At the same time, craftsmen who make the custom solutions, are disappearing, and with them, disappears the professional knowledge.

We are developing and designing parametric anatomic seating system, based on clinical and craftsman praxis, providing a fully customizable product, adapted for digital-manufacturing tools (laser cutting, CNC milling, 3D printing). In this way, we can produce every product unique for every individual function and need. Additionally, we preserve craftsman knowledge, serving people with disabilities needs. Our goal is to develop products, that enables the clinical staff as a physiotherapist, occupational therapist, etc., to create anatomic solutions at the push of a button — reducing the time between the measuring and the final product.

The lecture focuses on the possibilities of digital-manufacturing technology at assistive-technologies field, looking into the gaps and the challenges, also talking about the transaction between rapid prototyping to the real product, using large-scale additive manufacturing (LSAM) technology.

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