Fachtagung in Dortmund

The International Perspective

University of Europe for Applied Sciences

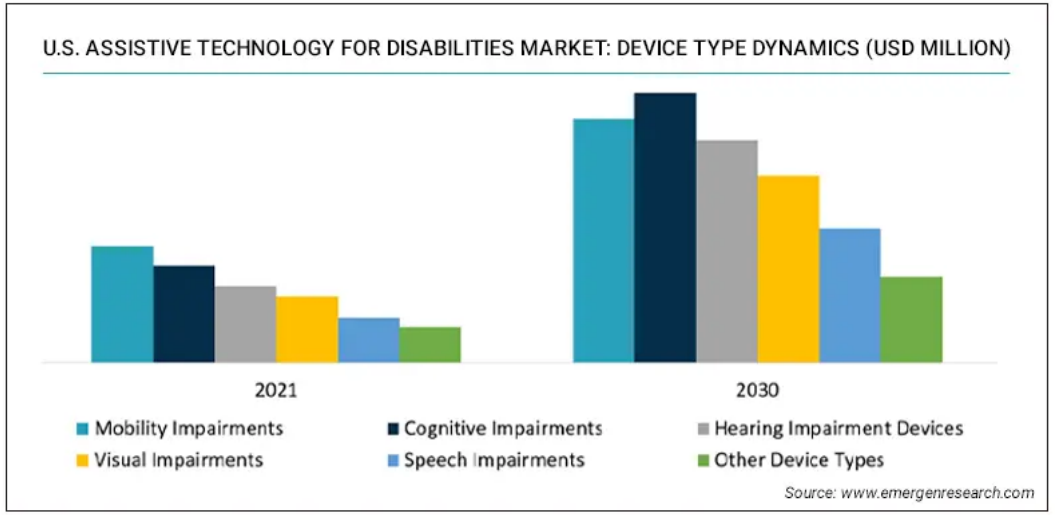
Digital Connectivity and 5G technology

5G technology grants better communication and interactions with users and applications. Providing support, safety, independence, and security to those that are living with limitations.

- Americas and Europe are leading in the launch of 5G,
- Asia is mostly a mix of invested and launched
- 25-member states in Europe have launched commercial 5G services
- Approximately **70 countries have launched 5G networks** and around **15 countries had 5G deployed** in the summer of 2022.

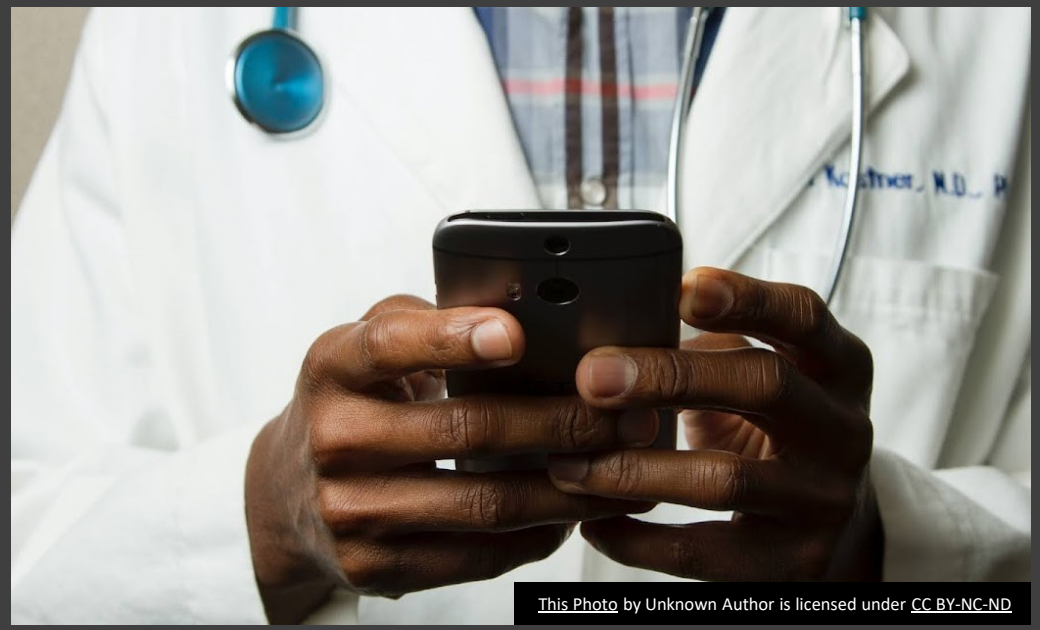
The Influence of the Aging Population

- The aging community is the largest group of AT users.
- CDC show over 34 million Americans have disabilities related to mobility. 2 out of 5 are over 65.
- ATs to support cognitive impairment are often associated with the elderly population as cognitive disorders that become more common with older age.
- There are currently 35.6 million people living with dementia on a global level and that figure is expected to double every 20 years (World Intellectual Property Organization, n.d.).
- With aging populations growing around the world, devices are being created to pose as an answer (Global Report on Assistive Technology, n.d.).



5G for the Elderly

- Wearable health monitors
- Smart home automation systems
- Telemedicine
- Mobility aids



MOTUS NOVA

"Our mission is to deliver high quality neuro-rehabilitation in every home through robotic exoskeletons guided by Artificial Intelligence."

- The Motus Hand and Foot: At-home stroke rehab robots with active assistance.
- Provides assistance when the user is struggling to finish a complete movement.
- The Motus AI constantly tracks and monitors user recovery so that it can adjust the level of assistance and resistance based on individual user needs.

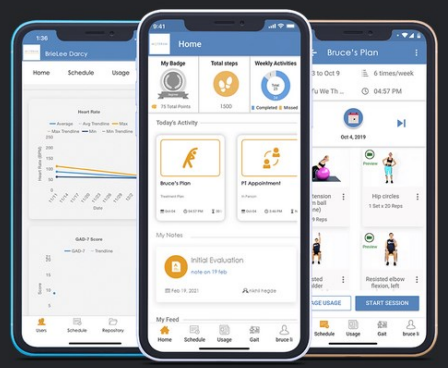
MOTERUM

Moterum's **iStride** Restore Walking Independence Post Stroke

The device is worn on the bottom of the unaffected leg of a stroke survivor, during treatment sessions

The Moterum Sensors collect data showing effort and improvement

A patented unique wheel shape creates a therapeutic walking motion that stimulates neural re-patterning and improves walking mechanics



Apps

Provides you Therapy, Community and Connection

Analytics

Provides information on how best to improve

Devices

Award winning devices treat your gait problems

Sensors & Tech

State of the art tech guides you

BTS Bioengineering

Motor and cognitive rehabilitation supported by AR/VR.

NIRVANA is a medical device that uses immersive virtual reality techniques for motor and cognitive neuro-rehabilitation of

patients of any age (children, adults, elderly) with neurological disorders such as stroke, cerebral palsy, Parkinson, autism.

NIRVANA creates a ‘sensory room’ where the patient can live an immersive, stimulating experience in various realistic scenarios.

Smart Home Devices

Smart home devices provide automation, safety, and convenience for seniors in their home. Purchased individually or as a bundle, these technologies are best used in conjunction with your smartphone to get the most out of their features. Below are a few of our favorite smart home devices for seniors.

	Smart speakers	Smart sensors	Video doorbells
Popular brands	Amazon Alexa, Google Assistant, Siri	Nest, Aloe Care Health, Abode, FIBARO	Arlo, Nest, Ring
What they do	Smart speakers can tell you the weather, set audio reminders, make calls, send texts for you, play music, play games, and more!	Smart sensors become familiar with your daily activity and monitor your home, sending alerts if anything is unusual.	View who is at your door via your smartphone or tablet. You can also see any activity outside your door such as a package drop-off. A two-way speaker allows you to chat with your visitor and remotely unlock the door for them to enter if you're unable to come to the door.
Why they're great for seniors	Seniors can activate this technology with their voice, rather than having to swipe or tap. For seniors who are less tech-savvy or have dexterity challenges, a smart speaker is a convenient digital companion.	Most smart sensors can be set up so they alert seniors and their loved ones if irregular activity is detected in the home, providing peace of mind for those who live alone.	Providing an extra layer of security and convenience, video doorbells are ideal for seniors who live alone or have limited mobility, since it gives them the ability to communicate and unlock the door for visitors via their smartphone.
Cost	$60-$300	$50-$200	$80-$250

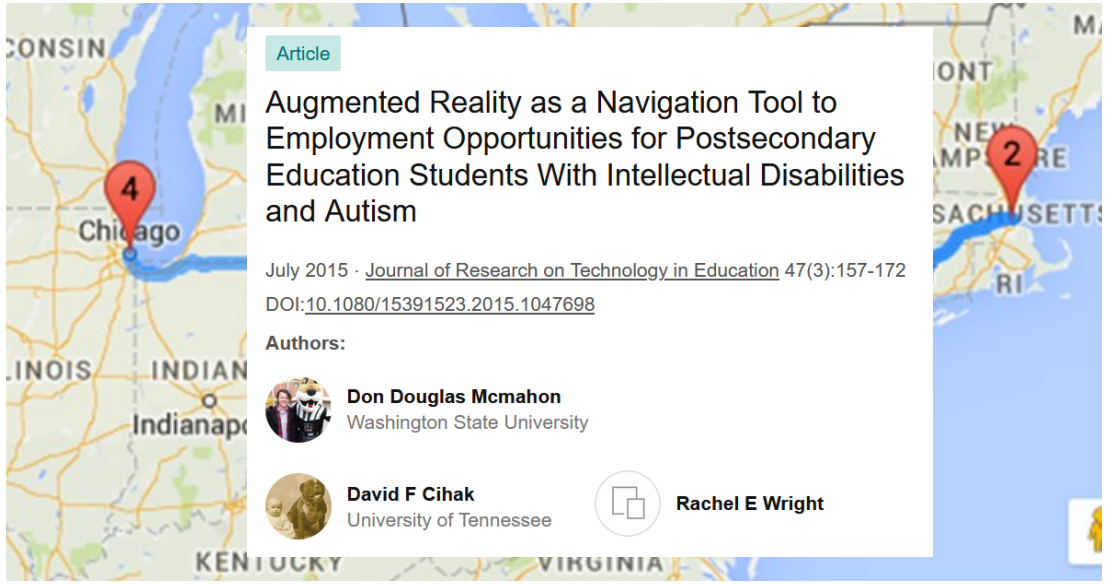
Companies and Universities

- Over half (53%) of patenting activity in the field of cognition assistive technology comes from **commercial players**
- Cognition assistive technology presents an opportunity for these companies to further **existing technology**.
- Meanwhile, universities and public research organizations account for **17%.**

THE UNIVERSITY OF TENNESSEE KNOXVILLE

Dr. David Cihak

- AR helped college students with disabilities independently self navigate to the destination.
- The AR was compared to Google maps and paper map
- VR interactive simulations for virtual job training for students and adults with Intellectual and developmental disabilities.



Augmented Reality Supporting Reading Skills of Students with Autism Spectrum Disorder

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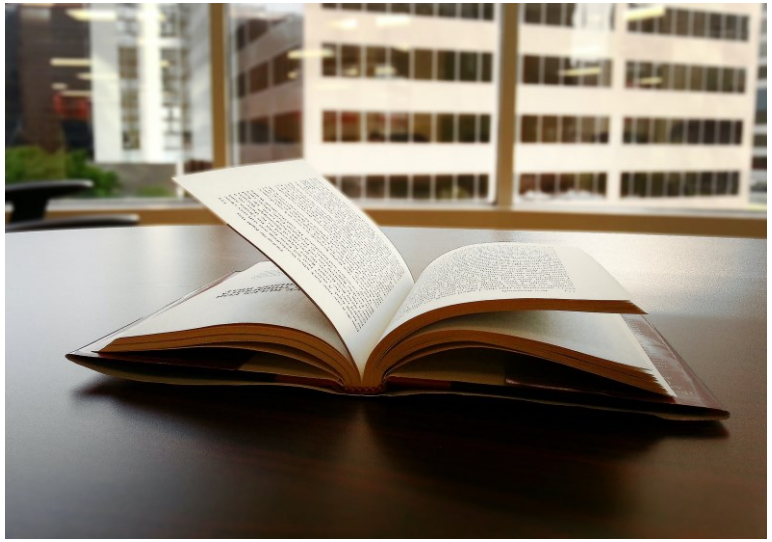


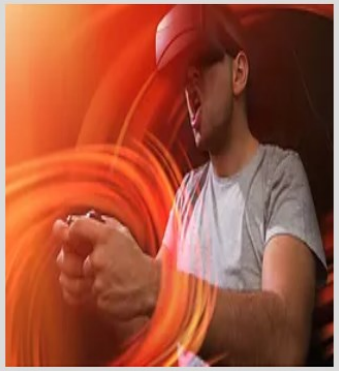
Abstract

Teachers' use of video modeling has been established as an evidence-based practice for teaching students with autism spectrum disorder (ASD). Augmented reality (AR) applications can be used as tools to provide trigger-based, video-modeled instructional supports to students with ASD. The use of AR in this way may help teachers implement evidence-based reading skills practice such as video modeling and provide more independent practice opportunities. It also provides more options for student engagement and concept representation. This article describes ideas for how to use a particular AR application to (a) teach phonics and word identification, (b) support reading fluency, (c) embed videos into texts as cues for reading comprehension, (d) teach content area vocabulary words, and (e) use video models during transition planning.

Dr. Sarah Howorth

1865 THE UNIVERSITY OF MAINE

SYNTHESIS
CENTER FOR RESEARCH AND EDUCATION
Cyprus



AUTISM-VR: SOCIAL INCLUSION OF PEOPLE WITH AUTISM SPECTRUM SYNDROME THROUGH VIRTUAL REALITY

The project 'Social Inclusion of People with Autism Spectrum Syndrome through Virtual Reality' (VRAA) aims to develop tools with the purpose of enhancing social inclusion of people with autism spectrum syndrome, using virtual reality.
A multi-skilled partnership composed of organisations active in the field of digital-based technologies, social, labour market integration, and special educational needs, will develop a VR training toolkit for people with ASD with the purpose of rehabilitation and training in communication and social skills. Furthermore, potential employers will be informed about the advantages of hiring a person with ASD.

More information ›

Microsoft

Neurodiversity, Tools

AI to support manufacturing and distribution jobs

In partnership with Gigi's Playhouse and TRI Industries, Clover Technologies designed an open-source conversational AI app to help people with Down Syndrome and/or autism perform jobs in manufacturing.

Microsoft

The cane controller closely simulates a real cane as used by the blind therefore opens up the doors to a large number of visually impaired already trained in the technique to enter a virtual space and be immediately at home. It enables navigation without vision of large virtual environments with complex architecture, such as winding paths and occluding walls and doors.

Microsoft Research shows off their novel VR cane controller again (video)

Vifr Tech

Startup in South India

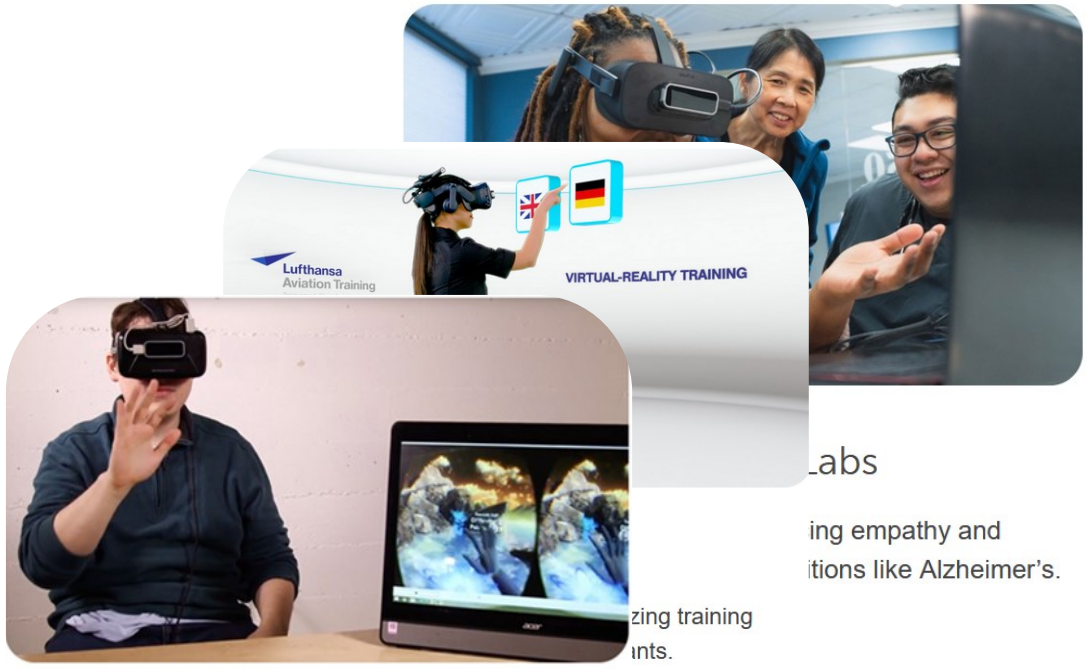
This technology helps to create simulated and controlled environments that help understand the sensory stimuli shown by people with ASD.

Halara is a complete virtual reality special education platform to train and teach young adults with autism and other neurodevelopmental conditions

halara

ultraleap

How VR medical technology can hack your brain – for good



Labs

ing empathy and
itions like Alzheimer's.

zing training
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Vivid Vision

The use of hands in VR is reversing vision problems, and curing "lazy eye".

The National Gallery of Prague

Created with help from NeuroDigital

NeuroDigital is a French IT serves and consulting.

VR experience that allows visually impaired and blind visitors to ‘touch’ some of the museum’s most famous sculptures, including the bust of Nefertiti and Michelangelo’s David.

International trends for assistive technology

- One important tendency in assistive technology for **cognitive disabilities** is the development of mid-level tech such as for **smartphone applications**
- Smartphones can be “low-cost” interventions that aid patients with cognitive disabilities.
- The ubiquitous nature of this mid-level technology has seen the **increasing trend of universal design principles** that are seen as greatly beneficial for adapting to user needs
- Focus on Rehabilitation and mobility

In Demand 5G Tech

- Wearable health monitors
  - Smart watches
- Smart home automation systems
  - Smart assistance
- Telemedicine
  - remote consultations with healthcare providers
- Virtual Reality (VR) training
  - learn new skills or overcome fears in a safe and controlled environment
- Assistive Robots
  - perform daily tasks or access information

Global Patent Trends

According to WIPO, the number of patent applications published between **2010 and 2019 grew by 157%,** from 49 to 126 documents, highlighting an increasing commercial interest in technologies addressing cognitive impairment.

Not all patents are 5G related.

US Market

- CDC suggest around 10% of individuals with disability in the U.S. have cognitive disabilities.
- Rapid Tech advances in devices for patients with disabilities is also drive **growth in the market**.

Challenges in the development of assistive technology

- Cost is the main barrier to getting access. High cost of ATs and low availability of products in remote regions
- People with disabilities have a higher chance of having lower education levels
- In the USA less than half of the households that are run by a person with disabilities use the internet
- In a world where digitization has been integrated with almost every aspect of life and digital technology for cognitively impaired people only slowly entering the market, may cause dramatic isolation.
- **A lack of inclusion in designs**

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Thank you

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