ERCIM ◆ NEWS

Special theme:

Assistive Technologies

for a More Accessible and Inclusive Society

Also in this issue

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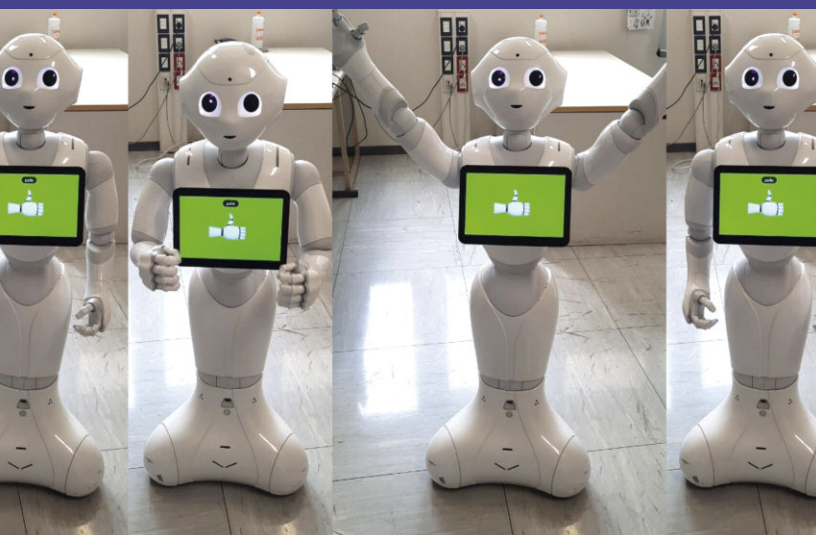
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Introduction to the special theme

Assistive Technologies for a More Accessible and Inclusive Society

by the guest editors Christine Azevedo Coste (Inria) and Barbara Leporini (ISTI-CNR)

People with disabilities and special needs may encounter difficulties in performing activities of daily living (ADLs), which affects their quality of life. Therefore, they have always sought alternative solutions and ways to be as autonomous as possible in performing activities of daily living in different areas such as education, work and even leisure and entertainment. Technology has opened up previously unthinkable scenarios by providing software and hardware that can compensate for the possible limitations of people with disabilities. There would be many examples we could cite for many categories of users.

When we refer to technologies that are designed to compensate for the difficulties of people with disabilities, we talk about assistive technologies. These include applications, software and digital tools, as well as robotic aids such as mobility aids for motion impaired people, screen readers and magnifiers for visually impaired users, applications for reading aloud, cognitive maps, etc. In addition, assistive technologies are understood as all digital and technological tools that in some way enable analysis or the provision of services that are useful to move forward in identifying problems and solutions to support people with difficulties. For this reason, research continues to address assistive technologies and proposes many studies and prototypes that represent progress in the field.

The field is very multidisciplinary and has a strong social impact, which explains the interest of different scientific communities. The keyword "assistive technology" is mentioned in 1086 articles on pubmed.org in 2021, compared to 584 in 2011. However, many scientific papers refer to assistive technologies, although they do not list "assistive technologies" among the keywords, but words like "accessibility" "autonomy" or specific words like "screen reader". It is therefore difficult to grasp how many papers there actually are in the literature.

Certainly on the topic of assistive technologies there is a lot of interest and a growing body of work. There has been considerable development in the area of accessibility of user interfaces and of software in general for a variety of reasons (education, everyday activities, entertainment, etc.), to the

use of devices, sensors and robotics to develop hardware assistive technologies that can overcome many limitations.

Conferences offer workshops and special sessions on this topic (IEEE Engineering in Medicine and Biology Society 2022, International Conference on Intelligent Robots and Systems IROS 2021, IEEE International Conference on Intelligent Systems 2020, etc). For Human-Computer Interaction (HCI) conferences, accessibility and assistive technologies are also among the accepted workshops and topics. These include annual or biennial conferences such as ACM Computer Human-Interaction (CHI), ACM Assets, Springer ICCHP, PETRA and so on. Technology challenge events such as Cybathlon [L1], Lyon Cyber Days, EPFL and Assistive Technologies Challenge are organised to promote these technologies and drive development.

Furthermore, over the years we have moved from the more specific concept of "accessibility" and "assistive technologies" that enable people with disabilities to perform certain activities, to the broader concept of "inclusion" that envisages the use of products and systems by all and not only by certain categories. This is also thanks to the contribution of Europe, which a few years ago started to talk about digital inclusion as a goal to be achieved in order to open up services to all and thus promote a more inclusive society. This has radically changed the perspective, also on the part of researchers, because there is a tendency to stop thinking about individual categories of users and start thinking about how to make a product and service truly usable for all, regardless of the difficulties and limitations that different people may have. In a way, this was a turning point in research and development.

So important is the contribution of Europe, which has put forward specific European directives in the field of accessibility and inclusion in terms of services and products open to all, such as EU Directives EU/2016/2102 and EU/2019/882, which provide for the use of products and services in an inclusive manner. This is undoubtedly a good sign of openness to inclusion, and this also has an impact on the world of research, the public and private sectors.

We therefore expect that in the coming years the different sectors, including research, will explore and propose new solutions that will support the implementation of the EU Directives in order to create an increasingly inclusive society.

This special issue aims to represent a further step in this field by presenting numerous contributions with studies in the field of assistive technology with different and complementary approaches. The papers presented deal with a variety of disabilities and special needs in different fields.

They range from looking at the collaboration of people with disabilities as an added value in finding solutions, to proposing useful services in the field of accessibility and digital innovation for all in the use of museum content, access to content and news, including internet accessibility.

Two papers address the problem of access to science content, astronomy and geology, for people with visual impairments or people who may have problems due to mobility issues.

Several contributions deal with applications for people with cognitive difficulties, e.g. serious games, or with software solutions for the inclusion of people with autism spectrum disorders in the world of work.

Also using software solutions, prototypes are proposed to help blind or visually impaired people perceive content useful for orientation or access to popular or scientific information.

Some contributions address the problem of movement support and therapy for people with motor difficulties.

Finally, a contribution based on the use of text-to-speech addresses people with severe hearing problems.

Links:
[L1] https://cybathlon.ethz.ch/en
[L2] https://ants-asso.com/en/lyon-cyber-days-en/
[L3] https://kwz.me/hjX

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