AMBRA uses AI to help people with communication disabilities




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Augmentative and alternative ccommunication (AAC) techniques leverage images and symbols to support individuals with communication disabilities. These methods help consolidate the autonomy levels of the individuals; for example, teaching them how to behave in many situations. However, individuals can understand symbols differently, meaning that personalized approaches are necessary.

A collaboration between Politecnico di Milano and Fondazione Artos, the AMBRA project is addressing these challenges by leveraging a combination of artificial intelligence (AI)-based methods to create a personalized learning environment in AAC. For example, it uses large language models to create texts or images, convolutional neural networks to automate the conversion of photos into symbols, and collaborative filtering to create personalized schedules. The AMBRA platform is cloud based and intended to be modular and easy to extend or cooperate with other AAC initiatives. For example, it leverages and extends the ARASAAC symbol library. Educators can share the learning material worldwide and further customize it to adapt to specific needs, cultures, or languages. The project is currently self-funded, leveraging support from research partners and industry to access computational resources.

Our approach aims to lower the technological, social, and cultural barriers to using AAC methods. The frontend of the AMBRA platform can run on all modern devices (such as smartphones, tablets, laptops, etc.) so that both educators and users can use it in every context, including real life.

Educators may exchange material more easily, creating a virtuous cycle that could boost the adoption of AAC methods. Having low-cost methods to create materials can encourage shops, public places, and community places to adopt such solutions and allow for a seamless transition between school and society, creating a more inclusive environment around the individuals. For example, QR codes allow users to download specific material (like a menu or a shopping list), which is later personalized based on specific user's information and symbols. This allows users to apply the autonomy concepts that have been acquired in class. AMBRA can also lower the cultural and language barriers when used with immigrants (for example using symbols from different cultures), facilitating their integration into a new community.

In conclusion, this project is intended to become a beacon to extend the use of AAC in real life. However, AMBRA's idea extends beyond its technical architecture; it embodies a vision for a more inclusive future where the boundaries of communication are pushed ever further thanks to the virtuous circle created by the combination of all these solutions, enabling society to include individuals with diverse communication needs who can express themselves with clarity and dignity in any context and without barriers. This approach can also lead to a rethink of the educator's role to be more open to worldwide collaboration in material and knowledge sharing.

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To stay updated on project news and connect with the AMBRA team, follow the LinkedIn page:
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"AMBRA [helps enable] society to include individuals with diverse communication needs who can express themselves with clarity and dignity in any context"

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