

# United Nations Convention on the Rights of Persons with Disabilities

Ratified by all EU member states in

2009

## Excerpt of the UN Convention

### Article 30 - Participation in cultural life, recreation, leisure and sport (1)

States Parties recognize the right of persons with disabilities to take part on an equal basis with others in cultural life, and shall take all appropriate measures to ensure that persons with disabilities:

Enjoy access to cultural materials in accessible formats;

Enjoy access to television programs, films, theatre and other cultural activities, in accessible formats;

Enjoy access to places for cultural performances or services, such as theatres, museums, cinemas, libraries and tourism services, and, as far as possible, enjoy access to monuments and sites of national cultural importance.

### Article 21

Urging private entities that provide services to the general public, including through the Internet, to provide information and services in accessible and usable formats for persons with disabilities; Encouraging the mass media, including providers of information through the Internet, to make their services accessible to persons with disabilities;

According to the 2008 Convention on the Rights of the Disabled, television content should be accessible to the deaf and regulators are requesting more signed content. The production of sign language programs is very expensive, therefore, many television producers mostly use only subtitles. However, many deaf people want more broadcasts in sign language.

CONTENT4ALL aims to develop a technical solution enabling broadcaster to offer more television content to deaf viewers in sign language. At the end of the project, an innovative technical system will allow an avatar (originated and inspired by a professional sign language interpreter) to present the television content as a natural sign language interpreter on television. A proof-of-concept of automatic sign-language generation is also foreseen for a restricted domain.



CONTENT4ALL

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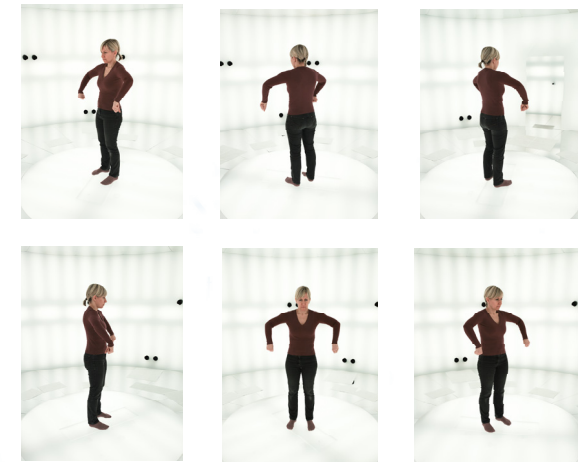
Content4All has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°762021.



CONTENT4ALL

Personalised Content Creation for the Deaf Community in a Connected Digital Single Market

CONTENT4ALL aims to make more content accessible to the deaf community by developing the necessary technologies and algorithms to capture a sign interpreter in a broadcaster remote studio, process it and render it making use of a state-of-the-art photorealistic 3D human avatar, who will look like a real sign language interpreter.



CONTENT4ALL lasts 3 years and uses the latest technologies such as online studios (not on-site) for TV stations, a self-learning system for recording sign language, automatic sign language generation and the 3D presentation of sign language via an avatar who will look like a real sign language interpreter. At the end of the project, the feasibility is tested on 2 scenarios: weather and sports news. Furthermore, the project results will be used for further research.

Via the final system, deaf viewers can simply connect the avatar interpreter to the original TV stream via HbbTV or mobile devices.

### Phase 1 (2017 – 2018)

Develop and deploy the HW/SW to capture a human signer in real-time (Remote Studio).

Develop a system to photo-realistically reproduce posture, gesture and facial expressions of the human sign interpreter via a 3D avatar. Deploy a system to generate and distribute a separate stream for deaf people, by mixing on server side the 3D avatar with the original content.

### Phase 2 (2018 - 2019)

Train a machine learning model for automatic translation into sign language and control of the 3D avatar using data captured during remote studio operation.

### Phase 3 (2019 - 2020)

Deploy a POC to automatic translate a limited domain (e.g. weather forecast, sport) into sign language.

Generate and distribute a separate stream with signing 3D avatar, mixed either server or client side with the original content.

### Broadcasters Requirements

- **More hours of signed content** (ideally all content, 24x7)
- **High Quality** of translation
- **Scalability and Speed**
- **No impact on hearing audience**
- **Lower costs** for producing signing content
- **Delivery on TV (HbbTV) and mobile devices**

### Project Requirements

- **Low-Cost studio for remote signing**
- Near **Real Time** interpretation
- **3D Photo Realistic avatar**
- **Separated stream** for Deaf viewers
- **Real testing domain**
- Proof-Of-Concept **automatic sign language generation** (restricted domain)

