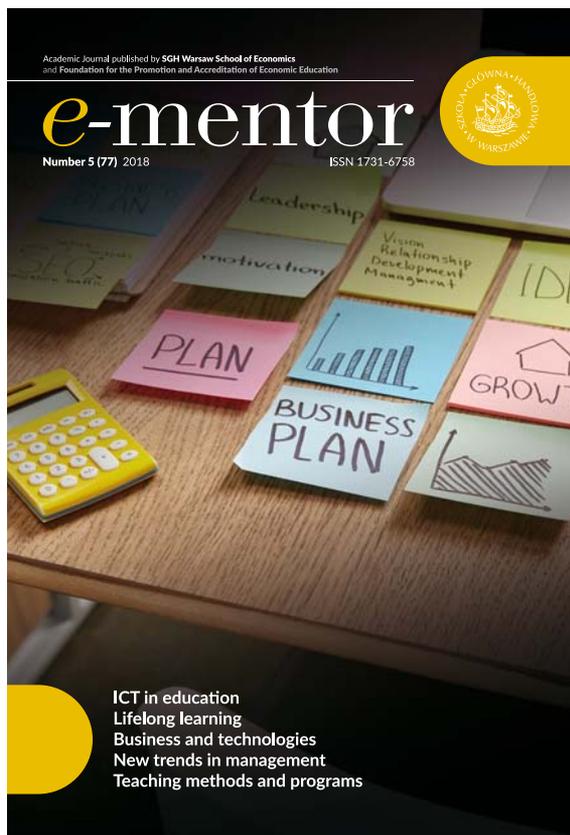


e-mentor

DWUMIESIĘCZNIK SZKOŁY GŁÓWNEJ HANDLOWEJ W WARSZAWIE
WSPÓŁWYDAWCA: FUNDACJA PROMOCJI I AKREDYTACJ KIERUNKÓW EKONOMICZNYCH

2018, nr 5 (77)



Adam Piasecki, Michał Socha, Wojciech Górka, Anna Jankowska, *OPENArt – a Tool Supporting Education in the Field of Culture and Art*, "e-mentor" 2018, No 5(77), pp. 53–59, <http://dx.doi.org/10.15219/em77.1389>.

OPENArt – a Tool Supporting Education in The Field of Culture and Art



Adam
Piasecki*



Michał
Socha*



Wojciech
Górka*



Anna
Jankowska**

As part of the project 'OPENArt – Contemporary Art for All,' a multimedia guide was developed in the form of an application for portable devices. It facilitates access to works of art exposed to people with hearing and visual impairments. It also improves the experience of receiving art by people without disabilities from Poland and abroad. The application corresponds to the real needs of users, as it was developed in accordance with the participatory design methodology and principles of universal design. This article describes problems in the access to art of various user groups. The authors present innovative features of the guide and characterize its educational values. The paper says how the application can be used to educate the blind, visually impaired, the deaf and hard of hearing, as well as by people working with non-disabled children in arts and language classes.

Availability of museum exhibits to the disabled

Many museums in Poland and all over the world make use of mobile technologies. In 2009 mobile applications were already used in the USA, France, UK, and the Netherlands (Piasecki and Dylewska-Libera, 2015, pp. 17–30). These applications not only present the museum exhibits but also engage the visitors in more in-depth exploration and understanding of particular works of art.

The solutions applied in museums are, first of all, the overall museum guides including essential museum/gallery information, maps of buildings and descriptions of the most recognized exhibits. More advanced solutions ensure access to extra materials and interpretations using the so-called augmented reality. There are also applications which are tools for games and plays, enabling explorations of the museums and galleries through drawing, solving riddles, doing puzzles, and others.

Since 2011–2012 such systems have been occurring in Polish museums as well (Piasecki and Dylewska-Libera, 2015, pp. 17–30). Unfortunately, neither Polish nor overseas applications offer universal solutions for users with different levels of knowledge and different disabilities.

The following are some examples of solutions used both in Poland and abroad:

- Unilever Series at Tate Modern by Tate Gallery – a guide describing all works from the Unilever Series. It includes photographs, videos, texts by curators and the museum director;¹
- Museo del Prado – Second Canvas – the application allows to view works from the permanent collection of the Prado Museum;²
- Murder Goes Mobile at the Met! – a detective game developed for the Metropolitan Museum of Art,³ designed mainly for young audience;
- The Museum of the Warsaw Uprising Warsaw'44 – an application guide.⁴

The solutions developed so far raise the attractiveness of the presented exhibits by applying new technologies (multimedia and mobile tools) (Stefanik and Kamel, 2013). Such an approach to museum exhibitions responds to the needs of new-type visitors; however, these solutions are far from being common. The problem boils down to their high implementation costs which, obviously, makes them unavailable to small museums or local halls of memory. Up until now there have not been universal solutions that would consider the needs of all visitors and could cope with the issue of cultural exclusion of people with sight and hearing dysfunctions.

People with sight and hearing disabilities, as well as those physically handicapped, are very often culturally excluded, which means they are excluded from an important aspect of social life. No access to education about culture and art results in social exclusion and

* Institute of Innovative Technologies EMAG, Katowice

** Jagiellonian University in Krakow

¹ <http://www.tate.org.uk/>

² <https://www.museodelprado.es/en/app/secondcanvasprado/>

³ <http://www.digitalmeetsculture.net/article/murder-goes-mobile-at-the-met/>

⁴ <http://www.1944.pl/>

lowers the opportunity to have sustainable development and education for all citizens (GUS, 2016).

It is commonly perceived that the needs of physically disabled people are obvious and most public institutions, including museums, take it into account by providing, for example, facilities for people on wheelchairs. Some museums make it possible for blind visitors to touch selected exhibits; however, adding extra information which exhibits exactly can be touched is necessary. In the case of the deafness and hard of hearing there is a problem that they might find it difficult to understand written texts. This disability seriously impacts the development of people, who often do not understand written and spoken words and cannot formulate their own statements (Górka et al., 2010; Szczepankowski, 1998). One has to bear in mind that for people who use a sign language since birth, the Polish language (or any other human language) is, in fact, a foreign language.

OPENArt – modern art for all

In the case of modern art, there are not only physical barriers that the disabled have to overcome but also the general opinion that modern art as such is difficult and incomprehensible. Such opinions result from the lack of adequate knowledge about this type of art. Contrary to classic art, which has been thoroughly described in literature and media, modern art remains a field of discretionary interpretations and approaches to particular works of art. The idea to relate a work of art to properly prepared information about it allows better understanding of modern art. This is helpful particularly to those people who experience modern art for the first time. Such a presentation of contemporary art museum exhibits was the primary goal of the OPENArt project, financed by the National Research and Development Centre within the 1st call of the Social Innovations programme. The project team developed a universal (the same for all groups

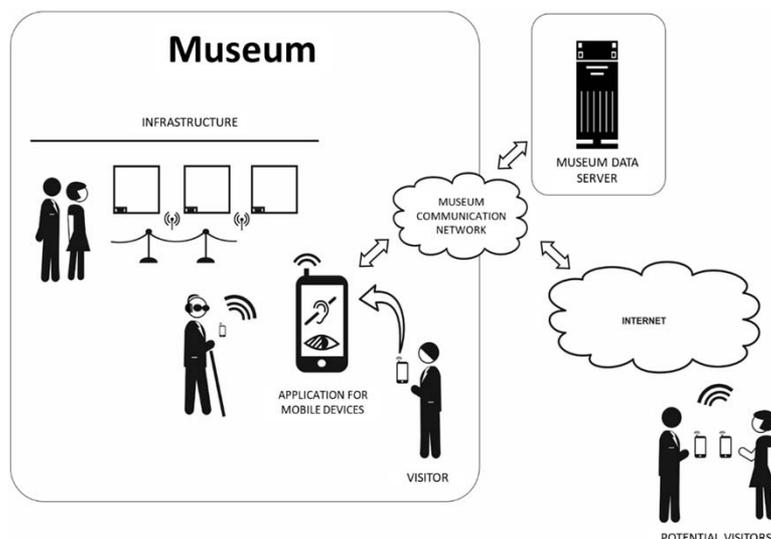
of users) multimedia guide in the form of an application for portable devices (smartphone and tablet). The guide facilitates access to works of art exhibited in museums. It is dedicated to the blind and the deaf people but can also be used by non-handicapped people from Poland and abroad.

The project was implemented by a consortium comprising research institutes (Institute of Innovative Technologies EMAG – the consortium leader and National Information Processing Institute OPI), public universities (the Jagiellonian University in Krakow and University of Warsaw), a non-public university (Polish-Japanese Academy of Information Technology), three big museums (National Museum in Kraków, National Museum in Warsaw and Museum of Contemporary Art MOCAK in Kraków), a foundation working for the benefit of the handicapped (Siódmy Zmysł), and a commercial company (Centrum Transferu Technologii EMAG sp. z o.o.).

The guide developed as a result of the OPENArt project applies the knowledge and experience of all consortium members. It provides a number of functionalities (work of art description, video, and materials) which expand the possibilities of perception of art. The idea of the OPEArt mobile multimedia guide can be seen in Figure 1. What distinguishes this guide from other ‘classic’ electronic educational materials is a strict connection of the multimedia content with the physical space of museums and galleries explored by the visitors, in the form of mixed reality. According to the mixed reality concept, the visitor receives extra information about the exhibit when he/she gets physically close to it.

The selected exhibits are radio-marked. This enables their automatic identification and gives access to the voice guide around the museum. Thanks to that, it is possible to match the guide contents with the currently visited exhibition and to navigate the blind through the building.

Figure 1. OPENArt mobile multimedia guide – operating principle



Source: authors’ own work.

OPENArt – a Tool Supporting Education in the Field...

OPENArt users

The OPENArt application is addressed to all potential users but targets three social groups particularly:

- seniors and handicapped people, especially the blind people and partially sighted as well as the deaf people and hard of hearing;
- children and young adults;
- foreigners.

This choice is due to the fact that most museums still use obsolete forms of presentation. Some museums offer audio description for the blind people, but most descriptions are too long, unattractive and do not allow unassisted navigation in the building. The proposed new solution is an innovative idea and fills the gap in the access to modern art of all social groups.

The OPENArt guide gives access to the world of culture and art to all people, including those with disabled sensory integration. The guide contents are available to the deaf in the form of subtitles or a sign language. OPENArt was equipped with an innovative technology which enables to position the visitor in the building and, this way, to automatically match the guide contents with the visited exhibition and give the user the navigation hints.

According to the data from Poland's Central Statistical Office (GUS) there are over 1,800 thousand people with sight disabilities in Poland (Informacja Rządu RP, 2013; GUS, 2003; GUS, 2016). The majority are those who lost their sight in the course of their lives. A significant group of these people leaves their homes very rarely and only a mere fraction takes active part in cultural life. People staying at home very often use computers with screen readers and internet access. More and more blind persons make use of facilities offered by smartphones (e.g., menu with a screen reader, embedded speech synthesizer or GPS).

The problem of hearing loss involves over six million Poles. It is estimated that the number of deaf people may oscillate between 45 and 50 thousand. Almost 900 thousand people in Poland suffer from severe hearing disabilities. Every sixth school-age child has hearing problems. For many deaf people, particularly those who were born deaf or lost their hearing in the pre-lingual age (i.e., before they learned to speak Polish), Polish is a foreign language (Januszkiewicz et al., 2014, pp. 5–13). Their first language is the Polish sign language. People who want to visit museums with a human guide need to be assisted by a sign language translator. Another, quite a numerous group with hearing disabilities are those who lost their hearing in the post-lingual age (after they learned to speak their mother tongue) and who do not use a sign language and do not have contact with the deaf community. Many of them are elderly people. That is the group to whom the subtitles in the OPEArt guide are addressed.

OPENArt in education

The development of the OPENArt application stemmed from the idea to give access to education on modern art to people with sight and hearing

disorders and to improve the quality of this education by making art presentations more attractive for non-handicapped people from Poland and abroad. The solution not only enables people with disabilities to enjoy so far inaccessible world of culture but also gives them a chance to receive some education in this area. Non-handicapped people, in turn, can learn and better understand art, including modern art, as the forms of presentations employed in OPENArt are adapted to the needs of today's receivers. The understanding of modern art is based on proper education and more frequent opportunities to experience art in person. The multimedia guide can be helpful to all who are afraid that experiencing modern art is a too ambitious challenge. It can also encourage them to have contacts with art more often. It is worth mentioning that the topic of the presented contents is practically unlimited and not restricted to art. The application can be used to present any contents.

The solution is able to counteract the exclusion of handicapped people, as well as those economically or otherwise disadvantaged, and to activate them to participate in cultural life and art. People with sight and hearing disabilities or physically disabled are often excluded from cultural life, so they are excluded from a very important aspect of social life. People with sensory disabilities have limited access to culture either due to physical or economic barriers. Poor access to culture causes social exclusion and lowers the opportunities of sustainable development and education.

The research conducted within the project showed that consuming modern art is a social practice and visiting modern art galleries or museums is an activity undertaken most frequently with friends. One of the reasons of such preferences is the opportunity to share one's interpretations or associations with other people. Thus, the universal character of the OPENArt application allows to integrate different social groups. The blind people who visit museums together with the sighted receive the same information about the exhibits which fosters free exchange of art-related opinions and experiences among all viewers. This way the multimedia guide can be used to educate the blind, partially sighted, deaf, and hard of hearing. It can be helpful in working with non-handicapped children during arts classes or foreign language classes. It supports activities to foster sustainable education in special schools, inclusive-education schools and standard schools.

The solution is based on two elements: functionality and knowledge base. Irrespective of the knowledge base volume, the application will always maintain full functionality. The contents of the knowledge base can be freely expanded and adapted to the real needs of museums. Thanks to that, the educational offer provided by the application can be directed to all receivers, at any point of their lives and on any education level. In order to adapt the contents to the perception abilities of the users, an extra element was developed in the application, i.e., guidelines for those

who prepare descriptions of the presented exhibits. In addition, the multimedia guide provides access to modern art exhibits to non-Polish speakers by providing English versions (both audio and subtitles). There are no problems with multiple languages of the users as they get information in the languages in which their smartphones work.

Due to the solution flexibility and easy management of information assets, the potential market for the solution is very big. In practice, the widest use is achieved by giving access to the mobile application of the guide on popular platforms like Android and iOS. This way every interested person can download the guide application and install it on his/her mobile tool from GooglePlay or AppStore application markets.

The OPENArt application enables to improve the quality of education and the quality of life of all social groups. In addition, it facilitates art-related education of children and young adults by using state-of-the-art technologies which are attractive to young users. The solution makes it possible to experience modern art by those who will go to the museum and those who, due to their place of living or other factors, cannot do it by themselves. What is more, the attractive and modern form of the multimedia guide encourages a wide group of potential users, particularly the young, to go to museums. The development of modern technologies, particularly growing popularity and common use of smartphones, results in a situation when mobile tools successfully replace audio and video players, books, or photo albums. Multi-functionality, availability and integration possibilities of smartphones make them excellent tools for presenting information about museum exhibits. The choice of mobile tools as the main data carriers for the guide contents resulted from the desire to develop a compact, multimedia and extensive set of information that would be available to a large group of users. Applying these tools, the users can raise their technological abilities and skills in using modern ICT technologies and update their knowledge in selected domains. Eventually, a raised education level of the society impacts the development of the knowledge society.

OPENArt social and economic aspects

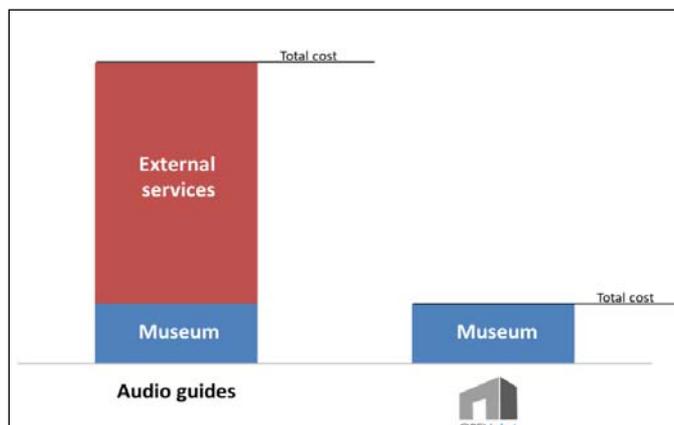
The development of the OPENArt guide is an initiative which connects modern art education with practical activities fostering the access to a widely understood world of culture and art for people who have not had such opportunities so far. Additionally, it provides a comfortable and unified space to learn about art and experience it irrespective of one's location, physical abilities, age and sex.

For the majority of handicapped people an active cultural life is simply inaccessible due to the lack of adequate facilities that should be offered by cultural institutions. Therefore, most often, these people stay at home. It is important to note, however, that they use modern IT tools and services more and more frequently. This fact was taken into account while developing the multimedia guide. The ability to use mobile tools by the disabled, along with the benefits of the OPENArt application, opens the doors to cultural and art education with no extra effort, in a comfortable and stress-free manner. This is a positive factor promoting the equal opportunities policy and social cohesion by raising people's awareness about the benefits of limiting social exclusion and overcoming barriers which discriminate certain social groups. Irrespective of the above, the use of the application by museums may have positive impact on better recognition of Polish (modern) art among local and overseas receivers.

Apart from obviously positive social significance of the developed solution, there are economic benefits too. They can be enjoyed both by visitors and museums. No doubt, the application can replace traditional audio guides and easily modify the contents offered to the visitors, with the use of any number of foreign languages. A big advantage of the solution is that it can be used in open public spaces, such as urban space or mixed space (both inside and outside the buildings). The support for the deaf is an important asset. It is possible to provide translation into a sign language by using either a video with a translator or an avatar.

In the case of traditional audio guides, the total cost of the solution consists of two elements (Figure 2.):

Figure 2. Differences in costs of implementation and maintenance of traditional audio guides and OPENArt in a museum



Source: authors' own work.

the cost of work provided by the museum to prepare the contents of the guides (exhibits descriptions) and the cost of external services, i.e. recording of the descriptions. In the case of OPENArt, practically the total cost is on the side of the museum as the application is a framework (there can be any content placed and there is one application for many museums available) and most functionalities were transferred to a smartphone. As regards the maintenance of the system, the museum is only responsible for the update of the content placed in the application. The adaptation of the application to the new system requirements is the responsibility of the application provider.

OPENArt innovative features

At present there are no solutions similar to OPENArt, neither in Poland nor abroad, that would be addressed to such a wide group of users. Most today's museums do not have guides or other materials adapted to the needs of the blind and the deaf. Some cultural institutions have prepared special descriptions of their exhibits for people with sight disabilities (in the form of audio description). However, these descriptions are hardly useful due to their considerable length and too much specificity. In the OPENArt project, for the first time in Poland, the universal design theory was used to describe museum objects. The needs of particular target groups of users were analyzed and on this basis the principles were defined how to apply universal design to works of art descriptions (Story, 2016). Then, a universal description method was applied to satisfy all potential users. The multimedia contents of the guide were adapted to the needs of users with sight (audio version) and hearing (subtitles, sign language) disabilities, as well as the needs of foreigners (English audio version and subtitles) (Szarkowska et al., 2015).

The project team have also made research on locating and identifying objects in closed spaces with the use of the so-called real-time locating systems (RTLS) (Bahl and Padmanabhan, 2000, pp. 775–784; Socha et al., 2015; Górká et al., 2010; Garcia-Valverde, 2013, pp. 702–718; Krumm and Horvitz, 2004, pp. 4–13). The majority of commonly used systems of that type are based on wireless measurement of distance. Here one can distinguish radio-, optical- (infrared radiation) and acoustic (ultrasounds) methods. The selection of an adequate method depends, first of all, on the conditions of the monitored area and on the demanded measurement accuracy. Acoustic and optical systems do better in smaller spaces, as they allow to obtain better accuracy. Radio systems work better in big spaces; however, their measurement accuracy is no better than 1m. In closed spaces it is necessary to take into account the reflection and absorption phenomena. The research within the project comprised methods based on optical, magnetic and radio techniques. Two types of methods were analyzed. Firstly, broadband methods with the ToA (Time of arrival) or TDoA (Time Difference of

Arrival) measurement techniques based on, respectively, the measurement of propagation time and the measurement of difference in propagation times and, secondly, Wi-Fi-based systems (standard 802.11x). Additionally, the analysis comprised solutions based on tools working in UWB (ultra-wideband), which ensure the highest precision in closed spaces and a big transmission bandwidth – now this technology is recognized as cutting edge and still remains in the realm of advanced development works.

The use of RTLS systems allowed automatic identification of museum exhibits and the user's location in the museum space (Socha et al., 2015). Thanks to that, the disabled, particularly those with sight dysfunctions, can visit the museum by themselves and can get information about the exhibits automatically, with no special effort on the user's side.

For testing reasons, 60 multimedia descriptions of selected exhibits (20 in each involved museum) were prepared. The contents and form of the descriptions were tested by potential users in terms of usefulness and availability. The research took place at the Gallery of Polish Art of the Twentieth Century at the National Museum in Krakow. The aim of the study was to assess the operation of the OpenArt application in the natural conditions of visiting the museum. 14 people were invited to visit the selected gallery using a multimedia guide, including:

- 6 people with visual disabilities (blind and partially blind);
- 2 people with hearing impairment;
- 6 people without disabilities.

The following were examined:

- ease of the users' interaction with the multimedia guide application;
- user interface – appearance, ease of use, intuitiveness;
- speed of application operation;
- attractiveness of the form of transferring information about the exhibits and their adaptation to the needs of people with sight or hearing problems;
- accuracy and precision of mechanisms for locating objects;
- attractiveness of the description;
- duration of the description.

The verification was carried out using the methods of observation, interview and questionnaire. The OpenArt application was approved by the respondents. In spontaneous assessments, they pointed to the deepened experience of communing with art and easier understanding of the artists' intentions. Based on the statements of the respondents, it can be concluded that the proposed form of the exhibits' description meets the needs of a wide spectrum of recipients – it meets the expectations of both blind and deaf people as well as those without dysfunctions.

The result of the verification tests will be used to make further improvements of the multimedia guide. Detailed results of the research will be the subject of another publication.

Conclusions

The OPENArt multimedia guide is not limited to a certain area and can be used locally, while visiting museums, as well as on the regional, national and international level thanks to the use of free application which enables free access to the museum exhibits irrespective of the user's current location or place of living. The application is available in museums and on the Internet. Thanks to equal and barriers-free access to culture, the application makes it possible for every person to experience modern art, with no division into different groups of users. The open formula of the guide makes it a usable tool for art education that can be applied in museums and galleries all over the world.

The application developed within the OPENArt project solves a socially sensitive problem of cultural exclusion and responds to a huge social demand of art availability to people with sight and hearing dysfunctions, for whom experiencing works of art in person has been practically impossible so far. Now they will be able to enjoy the museum or gallery exhibition by themselves thanks to the embedded module for localizing exhibits in space. Galleries and museums will be able to employ inclusion policies that would invite different social groups, including those with sight and hearing disorders, into the world of art, this way stimulating, through education, the growth of social development and social capital.

References

- Bahl, P., Padmanabhan, V.N. (2000). RADAR: An in-building RF-based user location and tracking system. *Proceedings IEEE INFOCOM 2000. The Conference on Computer Communications. Nineteenth Annual Joint Conference of the IEEE Computer and Communications Societies, USA, 3*, 775–784. DOI: 10.1109/INFCOM.2000.832252.
- Garcia-Valverde, T., Garcia-Sola, A., Hagra, H., Dooley, J. A., Callaghan, V., Botia, J.A. (2013). A fuzzy logic-based system for indoor localization using WiFi in ambient intelligent environments. *IEEE Transactions on Fuzzy Systems*, 21(4), 702–718.
- Górka, W., Piasecki, A., Sitek, B., Socha, M. (2010). INFOMAT-E – public information system for people with sight and hearing dysfunctions. *Proceedings of the International Multiconference on Computer Science and Information Technology (IMCSIT), IEEE*, 5, 593-598. DOI: 10.1109/IMCSIT.2010.5680027.
- GUS. (2003). *Narodowy Spis Powszechny Ludności i Mieszkań 2002*. Retrieved from <https://stat.gov.pl/spisy-powszechno/narodowe-spisy-powszechno/narodowy-spis-powszechny-2002/raport-z-wynikow-narodowego-spisu-powszechnego-ludnosci-i-mieszkan-2002,3,1.html>
- GUS. (2016). *Stan zdrowia ludności Polski w 2014 roku*. Retrieved from <https://stat.gov.pl/obszary-tematyczne/zdrowie/zdrowie-i-ochrona-zdrowia-w-2014-r-1,5.html>
- Hammadi, O.A., Hebsi, A.A., Zemerly, M.J., Ng, J.W.P. (2012). Indoor localization and guidance using portable smartphones. *Proceedings of the IEEE/WIC/ACM International Conferences on Web Intelligence and Intelligent Agent Technology, IEEE*. 337–341. DOI: 10.1109/WI-IAT.2012.262
- Informacja Rządu Rzeczypospolitej Polskiej o działaniach podejmowanych w 2012 roku na rzecz realizacji postanowień uchwały Sejmu Rzeczypospolitej Polskiej z dnia 1 sierpnia 1997 r. (2013). Warszawa: Karta Praw Osób Niepełnosprawnych.
- Januszkiewicz, M., Jura, M., Kowal, J. (2014). Każdy ma prawo do nauki. Prawo Głuchych do dostępu do języka i edukacji, In M. Sak (red.). *Edukacja Głuchych. Materiały konferencyjne* (pp. 8–16). Warszawa: Biuro Rzecznika Praw Obywatelskich.
- Krumm, J., Horvitz, E. (2004). Locadio: Inferring motion and location from wi-fi signal strengths. *Proceedings of The First Annual International Conference on Mobile and Ubiquitous Systems: Networking and Services, IEEE*, 4–13. DOI: 10.1109/MOBIO.2004.1331705.
- Piasecki, A. (2014). Wykorzystanie technologii komunikacyjnych przez osoby z dysfunkcjami narządów wzroku i słuchu. *Studia Ekonomiczne – Zeszyty Naukowe Uniwersytetu Ekonomicznego w Katowicach*, 199, 240–248.
- Piasecki A., Dylewska-Libera, M. (2015). *Dostępne muzeum – technologie mobilne przeciwko wykluczeniu z kultury*. In: *Informatyka na Śląsku – nowe technologie i zastosowania* (pp. 17–30). Katowice: Instytut Technik Innowacyjnych EMAG.
- Socha, M., Górka, W., Stęclik, T., Piasecki, A. (2015). *Badania dokładności lokalizacji w przestrzeniach zamkniętych z wykorzystaniem sygnału radiowego*. In M. Sikora (Ed.). *Informatyka na Śląsku – nowe technologie i zastosowania* (pp. 31–40). Katowice: Instytut Technik Innowacyjnych EMAG.
- Socha, M., Górka, W., Piasecki, A. (2015). *Determining the position based on the strength of the radio signal with the use of the collections convergence*. In: M. Rostanski, P. Pikiewicz, P. Buchwald (Eds.), *Internet in the Information Society 2015. 10th International Conference Proceedings* (pp. 47–55). Dąbrowa Górnicza: Wyższa Szkoła Biznesu.
- Socha, M., Górka, W., Piasecki, A. (2016). *Mobile application supporting the universal access to culture, taking into account the needs of disabled people*. In: M. Rostanski, P. Pikiewicz, P. Buchwald (Eds.), *Proceedings of the 11th International Conference Internet in the Information Society 2016* (pp. 192–202). Dąbrowa Górnicza: Wyższa Szkoła Biznesu.
- Stefanik, M., Kamel, M. (2013). *Muzea i wystawy interaktywne w Polsce – współczesna atrakcja turystyczna. Turystyka Kulturowa*. 8. 5–23.
- Story, M.F. (2011). *The Principles of Universal Design*. In W.F.E. Preiser, K.H. Smith (Eds.). *Universal design handbook*. New York: McGraw-Hill.
- Szarkowska, A., Jankowska, A., Krejtz, K., & Kowalski, J. (2016). Open Art: Designing Accessible Content in a Multimedia Guide App for Visitors with and without Sensory Impairments. In A. Matamala & P. Orero (Eds.), *Researching Audio Description. Palgrave Studies in Translating and Interpreting* (pp. 301–320). London: Palgrave Macmillan. DOI: 10.1057/978-1-137-56917-2_16.
- Szczepankowski, B. (1998). Osoby z uszkodzonym słuchem. In B. Szczepankowski, A. Ostrowska (Eds.). *Problem niepełnosprawności w poradnictwie zawodowym. Zeszyty Informacyjno-Methodyczne Doradcy Zawodowego*, 10 (pp. 67–90). Warszawa: Krajowy Urząd Pracy.

OPENArt – a Tool Supporting Education in the Field...

Abstract

Many museums in Poland and all over the world make use of mobile technologies. Unfortunately, neither Polish nor overseas applications offer universal solutions for users with different levels of knowledge and different disabilities. People with sight and hearing disabilities, as well as those physically handicapped, are very often culturally excluded, which means they are excluded from an important aspect of social life. As part of the project 'OPENArt – Contemporary Art for All,' a multimedia guide was developed in the form of an application for portable devices. It was designed in accordance with the participatory design methodology and principles of universal design. It facilitates access to works of art exposed to people with hearing and visual impairments. The application can be used to educate the blind, visually impaired, the deaf and hard of hearing, as well as people working with non-disabled children in arts and language classes. In the paper the innovative features of the guide were presented, and its educational values were characterized.

Keywords: universal design; audio description; modern art; museum; mobile applications

Adam Piasecki is an assistant at the Institute of Innovative Technologies EMAG, Ph.D. candidate at the Faculty of Informatics and Communication of the University of Economics in Katowice. Leader of multiple projects related to the development of solutions aimed at preventing social exclusion and to the implementation of IT projects in industry and administration.

Michał Socha is an assistant at the Institute of Innovative Technologies EMAG. Software engineer. Specializes in the design of computer systems with the use of artificial intelligence. Co-author of solutions related to the use of ICT to prevent and eliminate social exclusion.

Wojciech Górka is an assistant at the Institute of Innovative Technologies EMAG. System analyst and software engineer. He specializes in the design of computer systems. He also co-authored solutions related to the use of ICT to prevent and eliminate social exclusion.

Anna Jankowska, Ph.D., is an assistant at the Chair of Translation Studies and Intercultural Communication of Jagiellonian University in Krakow. Postdoctoral trainee at the Universitat Autònoma de Barcelona in 2016–2019. Co-founder and president of 'Siódmy Zmysł' Foundation. Audio description specialist and audio-visual translator. Engaged in the issue of availability for 10 years. Her research interests focus on the issue of providing availability of different spheres of human life to people with special needs, particularly through the use of innovative technologies.

WE RECOMMEND

17th International Conference e-Society 2019, April 11–13, 2019, Utrecht, The Netherlands



The e-Society 2019 conference aims to address the main issues of concern within the Information Society. This conference covers both the technical as well as the non-technical aspects of the Information Society. Broad areas of interest are e-Government / e-Governance, e-Business / e-Commerce, Technology and Society, e-Learning, New Media and E-Society, e-Health, Information Systems, and Information Management. These broad areas are divided into more detailed areas.

More information: <https://www.esociety-conf.org>