IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.301
Volume 3, Issue 3, December 2023

Reviews on Various Technologies Used For Visually Disable People

Mannepuli Srujana[1] and Dr. Vijay Pal Singh[2]
Research Scholar, Department of Computer Science and Engineering[1]
Research Guide, Department of Computer Science and Engineering[2]
OPJS University, Churu, Rajasthan, India

Abstract: *In an effort to overcome a variety of challenges encountered by individuals with disabilities including visual impairment, motor disability, and communication difficulties computer vision has demonstrated considerable promise. This report provides an examination of the current state of computer vision-based assistive technology, as well as significant challenges and areas for future research. This study specifically investigates the applications of computer vision in the domains of gesture-based control interfaces, object recognition, navigation, facial recognition, and sign language interpretation. Additionally, the article examines the advantages and disadvantages of different methodologies and technologies, and provides illustrations of how computer vision can be integrated into existing assistive technologies to enhance their effectiveness. This investigation addresses the privacy and ethical concerns associated with the application of computer vision to assistive technologies. Additionally, the research emphasizes the necessity for protocol standardization, enhanced user-centered design, and practical efficacy evaluation as prospective areas of investigation to refine the application of computer vision in assistive technology. In general, this article illuminates the potential transformative impact that computer vision could have on assistive technologies designed for individuals with disabilities.*

Keywords: Computer Vision, Assistive Technologies, Disabilities, Visual Impairment, Accessibility, Human-Computer Interaction (HCI)

REFERENCES

[1] Abraham, L., Mathew, N. S., George, L., & Sajan, S. S. (2020, June). VISION-wearable speech based feedback system for the visually impaired using computer vision. In 2020 4th International Conference on Trends in Electronics and Informatics (ICOEI)(48184) (pp. 972-976). IEEE.

[2] Akilan, T., Wu, Q. J., & Zhang, H. (2018). Effect of fusing features from multiple DCNN architectures in image classification. IET Image Processing, 12(7), 1102-1110.

[3] Amtmann, D., McMullen, K., Bamer, A., Fauerbach, J. A., Gibran, N. S., Herndon, D, Schneider, J.C, Koalske, K.,Holavanahalli, R., & Miller, A. C. (2020). National institute on disability, independent living, and rehabilitation research burn model system: review of program and database. Archives of physical medicine and rehabilitation, 101(1), S5-S15.

[4] Andrich, R. (2013). Service Delivery Systems for Assistive Technology in Europe: A Position Paper. In Assistive Technology: From Research to Practice (pp. 247-253). IOS Press.

[5] Antoniadi, A. M., Du, Y., Guendouz, Y., Wei, L., Mazo, C., Becker, B. A., & Mooney, C. (2021). Current challenges and future opportunities for XAI in machine learning-based clinical decision support systems: a systematic review. Applied Sci-ences, 11(11), 5088.

[6] Arigo, D., Lobo, A. F., Ainsworth, M. C., Baga, K., & Pasko, K. (2022). Development and initial testing of a personalized, adaptive, and socially focused web tool to support physical activity among women in midlife: multidisciplinary and user- centered design approach. JMIR Formative Research, 6(7), e36280.

[7] Busaeed, S., Mehmood, R., Katib, I., & Corchado, J. M. (2022). LidSonic for Visually Impaired: Green Machine Learning-Based Assistive Smart Glasses with Smart App and Arduino. Electronics, 11(7), 1076.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.301
Volume 3, Issue 3, December 2023

[8] Calabrò, R. S., Cerasa, A., Ciancarelli, I., Pignolo, L., Tonin, P., Iosa, M., & Morone, G. (2022). The Arrival of the Metaverse in Neurorehabilitation: Fact, Fake or Vision?. Biomedicines, 10(10), 2602.

[9] Chai, J., Zeng, H., Li, A., & Ngai, E. W. (2021). Deep learning in computer vision: A critical review of emerging techniques and application scenarios. Machine Learning with Applications, 6, 100134.

[10] Chen, C., Wang, Y., Niu, J., Liu, X., Li, Q., & Gong, X. (2021). Domain knowledge powered deep learning for breast cancer diagnosis based on contrast-enhanced ultrasound videos. IEEE Transactions on Medical Imaging, 40(9), 2439-2451.

[11] de Belen, R. A. J., Bednarz, T., Sowmya, A., & Del Favero, D. (2020). Computer vision in autism spectrum disorder research: asystematic review of published studies from 2009 to 2019. Translational psychiatry, 10(1), 333.

[12] Faria Oliveira, O. D., Carvalho Gonçalves, M., de Bettio, R. W., & Pimenta Freire, A. (2022). A qualitative study on the needs of visually impaired users in Brazil for smart home interactive technologies. Behaviour & Information Technology, 1-29.

[13] Fazelpour, S., & Danks, D. (2021). Algorithmic bias: Senses, sources, solutions. Philosophy Compass, 16(8), e12760.

[14] Finco, M. D., Dantas, V. R., & dos Santos, V. A. (2023). Exergames, Artificial Intelligence and Augmented Reality: Connections to Body and Sensorial Experiences. In Augmented Reality and Artificial Intelligence: The Fusion of Advanced Technolo- gies (pp. 271-282). Cham: Springer Nature Switzerland.

[15] Haghpanah, M. A., Vali, S., Torkamani, A. M., Masouleh, M. T., Kalhor, A., & Sarraf, E. A. (2023). Real-time hand rubbing quality estimation using deep learning enhanced by separation index and feature-based confidence metric. Expert Systems with Applications, 119588.

[16] Hemsley, B., Balandin, S., Palmer, S., & Dann, S. (2017). A call for innovative social media research in the field of augmentative and alternative communication. Augmentative and Alternative Communication, 33(1), 14-22.

[17] Hitelman, A., Edan, Y., Godo, A., Berenstein, R., Lepar, J., & Halachmi, I. (2022). Biometric identification of sheep via a machine- vision system. Computers and Electronics in Agriculture, 194, 106713.

[18] Hramov, A. E., Maksimenko, V. A., & Pisarchik, A. N. (2021). Physical principles of brain–computer interfaces and their appli- cations for rehabilitation, robotics and control of human brain states. Physics Reports, 918, 1-133.

[19] Hsieh, Y. H., Granlund, M., Odom, S. L., Hwang, A. W., & Hemmingsson, H. (2022). Increasing participation in computer activ- ities using eye-gaze assistive technology for children with complex needs. Disability and Rehabilitation: Assistive Technology, 1-14.

[20] Jafri, R., Ali, S. A., & Arabnia, H. R. (2013). Computer vision-based object recognition for the visually impaired using visual tags. In Proceedings of the International Conference on Image Processing, Computer Vision, and Pattern Recognition (IPCV) (p. 1). The Steering Committee of The World Congress in Computer Science, Computer Engineering and Applied Computing (WorldComp).

[21] Jiang, D., Li, G., Tan, C., Huang, L., Sun, Y., & Kong, J. (2021). Semantic segmentation for multiscale target based on object recognition using the improved Faster-RCNN model. Future Generation Computer Systems, 123, 94-104.

[22] Ki, C. W. C., Cho, E., & Lee, J. E. (2020). Can an intelligent personal assistant (IPA) be your friend? Para-friendship development mechanism between IPAs and their users. Computers in Human Behavior, 111, 106412.

[23] Krahn, G. L. (2011). WHO World Report on Disability: a review. Disability and health journal, 4(3), 141-142.

[24] Krishnan, S., Mandala, M., Wolf, S. L., Howard, A., & Kesar, T. (2023). Perceptions of stroke survivors regarding factors affecting adoption of technology and exergames for rehabilitation. PM&R.

[25] Lamontagne, M. E., Routhier, F., & Auger, C. (2013). Team consensus concerning important outcomes for augmentative and alternative communication assistive technologies: A pilot study. Augmentative and Alternative Communication, 29(2), 182- 189.

[26] Layton, N., MacLachlan, M., Smith, R. O., & Scherer, M. (2020). Towards coherence across global initiatives in assistive tech- nology. Disability and Rehabilitation: Assistive Technology, 15(7), 728-730.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.301
Volume 3, Issue 3, December 2023

[27] Lee, S. H., & Yang, C. S. (2017). A real time object recognition and counting system for smart industrial camera sensor. IEEE Sensors Journal, 17(8), 2516-2523.
[28] Lenker, J. A., Harris, F., Taugher, M., & Smith, R. O. (2013). Consumer perspectives on assistive technology outcomes. Disability and Rehabilitation: Assistive Technology, 8(5), 373-380.
[29] Louhab, F. E., Bahnasse, A., Bensalah, F., Khiat, A., Khiat, Y., & Talea, M. (2020). Novel approach for adaptive flipped classroom based on learning management system. Education and Information Technologies, 25, 755-773.
[30] Majil, I., Yang, M. T., & Yang, S. (2022). Augmented Reality Based Interactive Cooking Guide. Sensors, 22(21), 8290.
[31] Medina, A., Méndez, J. I., Ponce, P., Peffer, T., Meier, A., & Molina, A. (2022). Using deep learning in real-time for clothing classification with connected thermostats. Energies, 15(5), 1811.
[32] Mhasawade, V., Zhao, Y., & Chunara, R. (2021). Machine learning and algorithmic fairness in public and population health. Na- ture Machine Intelligence, 3(8), 659-666.
[33] Milakis, D. (2019). Long-term implications of automated vehicles: An introduction. Transport Reviews, 39(1), 1-8.
[34] Patil, V., Narayan, J., Sandhu, K., & Dwivedy, S. K. (2022). Integration of virtual reality and augmented reality in physical rehabilitation: a state-of-the-art review. Revolutions in Product Design for Healthcare: Advances in Product Design and De- sign Methods for Healthcare, 177-205.
[35] Priestley, M. (2007). In search of European disability policy: Between national and global. Alter, 1(1), 61-74.
[36] Ren, Z., Fang, F., Yan, N., & Wu, Y. (2022). State of the art in defect detection based on machine vision. International Journal of Precision Engineering and Manufacturing-Green Technology, 9(2), 661-691.
[37] Sahoo, S. K., & Choudhury, B. B. (2021). A Fuzzy AHP Approach to Evaluate the Strategic Design Criteria of a Smart Robotic Powered Wheelchair Prototype. In Intelligent Systems: Proceedings of ICMIB 2020 (pp. 451-464). Singapore: Springer Sin-gapore.
[38] Sahoo, S., & Choudhury, B. (2022). Optimal selection of an electric power wheelchair using an integrated COPRAS and EDAS approach based on Entropy weighting technique. Decision Science Letters, 11(1), 21-34.
[39] Sahoo, S., & Choudhury, B. (2023). Voice-activated wheelchair: An affordable solution for individuals with physical disabili- ties. Management Science Letters, 13(3), 175-192.
[40] Sahoo, S., & Goswami, S. (2024). Theoretical framework for assessing the economic and environmental impact of water pollution: A detailed study on sustainable development of India. Journal of Future Sustainability, 4(1), 23-34.
[41] Shamsolmoali, P., Zareapoor, M., Granger, E., Zhou, H., Wang, R., Celebi, M. E., & Yang, J. (2021). Image synthesis with adversarial networks: A comprehensive survey and case studies. Information Fusion, 72, 126-146.
[42] Sharadhi, A. K., Gururaj, V., Shankar, S. P., Supriya, M. S., & Chogule, N. S. (2022). Face mask recogniser using image pro- cessing and computer vision approach. Global Transitions Proceedings, 3(1), 67-73.
[43] Silva Jr, E. T., Sampaio, F., da Silva, L. C., Medeiros, D. S., & Correia, G. P. (2020). A method for embedding a computer vision application into a wearable device. Microprocessors and Microsystems, 76, 103086.
[44] Smith, R. O. (2016). The emergence and emergency of assistive technology outcomes research methodology. Assistive Technology Outcomes & Benefits, 10(1), 19-37.
[45] Szeto, A. (2005). Rehabilitation engineering and assistive technology. In Introduction to biomedical engineering (pp. 211-254). Academic Press.
[46] Tavasoli, S., Pan, X., & Yang, T. Y. (2023). Real-time autonomous indoor navigation and vision-based damage assessment of reinforced concrete structures using low-cost nano aerial vehicles. Journal of Building Engineering, 68, 106193.
[47] Vélez-Guerrero, M. A., Callejas-Cuervo, M., & Mazzoleni, S. (2021). Artificial intelligence-based wearable robotic exoskeletons for upper limb rehabilitation: A review. Sensors, 21(6), 2146.
[48] Ward, T. M., Mascagni, P., Ban, Y., Rosman, G., Padoy, N., Meireles, O., & Hashimoto, D. A. (2021). Computer vision in surgery. Surgery, 169(5), 1253-1256.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.301
Volume 3, Issue 3, December 2023

[49] World Health Organization. (2021). WHO Policy on disability.

[50] Yenugula, M., Sahoo, S., & Goswami, S. (2023). Cloud computing in supply chain management: Exploring the relationship. Man- agement Science Letters, 13(3), 193-210.

[51] Yenugula, M., Sahoo, S., & Goswami, S. (2024). Cloud computing for sustainable development: An analysis of environmental, economic and social benefits. Journal of future sustainability, 4(1), 59-66.

[52] Yirtici, T., & Yurtkan, K. (2022). Regional-CNN-based enhanced Turkish sign language recognition. Signal, Image and Video Processing, 1-7.

[53] Ymous, A., Spiel, K., Keyes, O., Williams, R. M., Good, J., Hornecker, E., & Bennett, C. L. (2020, April). " I am just terrified of my future"—Epistemic Violence in Disability Related Technology Research. In Extended Abstracts of the 2020 CHI Confer-ence on Human Factors in Computing Systems (pp. 1-16).

[54] Zhou, T., Wang, W., Liang, Z., & Shen, J. (2021). Face forensics in the wild. In Proceedings of the IEEE/CVF conference on computer vision and pattern recognition (pp.