May 2026: Top Read Articles in Multimedia & Its Applications

The International Journal of Multimedia & Its Applications (IJMA)

---ERA Indexed---

https://airccse.org/journal/ijma.html

ISSN: 0975-5578(Online); 0975-5934 (Print)

THE CURRENT TRENDS OF AUGMENTED REALITY IN EARLY CHILDHOOD EDUCATION

Masyarah Zulhaida Masmuzidin and Nor Azah Abdul Aziz

Department of Creative Multimedia,Universiti Pendidikan Sultan Idris, Tanjung Malim, Perak Darul Ridzuan, Malaysia.

ABSTRACT

Augmented Reality has been widely used in various level of education such as higher-level education, secondary education (lower/upper secondary level), primary education, and in informal learning. However, the implementation in early childhood education is still limited. By using library research methodology, the objective of this paper is to investigate the existing work of augmented reality in early childhood education between 2009-2018. Based on the results, it shows that the publication of augmented reality in early childhood education increased slowly within these past ten years. It has been found that the main advantage of augmented reality is to enhance motivation. Early literacy has been found to be the most used topic with sampling less than 30 children. Finally, 'Marker-based' augmented reality has been widely used with mobile devices and in term of data collection methods, 'Test' has been used the most in this field of research.

KEYWORDS

Augmented Reality, Child Computer Interaction, Early Childhood Education, Preschool

Full Text: https://aircconline.com/ijma/V10N6/10618ijma05.pdf

Volume Link: https://www.airccse.org/journal/ijma_current18.html

REFERENCES

[1] Azuma, R. T. (1997). A survey of augmented reality. Presence: Teleoperators & Virtual Environments, 6(4), pp. 355-385.

[2] Azuma, R., Baillot, Y., Behringer, R., Feiner, S., Julier, S., & MacIntyre, B. (2001). Recent advances in augmented reality. IEEE Computer Graphics & Application, 21(6), pp. 34-47.

[3] Wu, H. K., Lee, S. W. Y., Chang, H. Y., & Liang, J. C. (2013). Current status, opportunities and challenges of augmented reality in education. Computers & education, 62, pp. 41-49.

[4] Rambli, D. R. A., Matcha, W., & Sulaiman, S. (2013). Fun learning with AR alphabet book forpreschool children. Procedia computer science, 25, pp. 211-219.

[5] Gopalan, V. (2016). A study of students' motivation based on ease of use, engaging, enjoyment and fun using the augmented reality science textbook. Revista de la Facultad de Ingeniería, 31(5).

[6] Yilmaz, R. M., Kucuk, S., & Goktas, Y. (2017). Are augmented reality picture books magic or real for preschool children aged five to six?. British Journal of Educational Technology, 48(3), pp. 824-841.

[7] Rasalingam, R. R., Muniandy, B., & Rass, R. (2014). Exploring the application of augmented reality technology in early childhood classroom in Malaysia. Journal of Research & Method in Education (IOSR-JRME), 4(5), pp. 33-40.

[8] Jeffri, N. F. S., & Rambli, D. R. A. (2017). Design and development of an augmented reality book and mobile application to enhance the handwriting-instruction for pre-school children. Open Journal of Social Sciences, 5(10), pp. 361.

[9] Hsu, Y. S., Lin, Y. H., & Yang, B. (2017). Impact of augmented reality lessons on students' STEM interest. Research and Practice in Technology Enhanced Learning, 12(1), pp. 2.

[10] Bacca, J., Baldiris, S., Fabregat, R., & Graf, S. (2015). Mobile augmented reality in vocationaleducation and training. Procedia Computer Science, 75, pp. 49-58.

AUTHORS

Masyarah Zulhaida Masmuzidin obtained her MSc in Creative Media Technology with Computer Animation and Special Effects from University of Bradford, United Kingdom. Currently, she is a PhD student at Faculty of Art Computing and Creative Industry, Universiti Pendidikan Sultan Idris, Malaysia. Her research interest includes Interactive Multimedia, Child Computer Interaction, Virtual Reality and Augmented Reality.

Nor Azah Abdul Aziz is an Associate Professor at Faculty of Art Computing and Creative Industry, Universiti Pendidikan Sultan Idris, Malaysia. Her research interest includes Gestural Interface Design, Child Computer Interaction, Multimedia Application Development, Islamic Spiritual Psychology , Information Technology, Internet/Web Filtering,Internet & Society.

INFORMATION HIDING USING AUDIO STEGANOGRAPHY – A SURVEY

Jayaram P[1], Ranganatha H R[2], Anupama H S[3]

[1,2,3] Department of Computer Science and Engineering, R V College of Engineering, Bangalore, INDIA

ABSTRACT

Today's large demand of internet applications requires data to be transmitted in a secure manner. Data transmission in public communication system is not secure because of interception and improper manipulation by eavesdropper. So the attractive solution for this problem is Steganography, which is the art and science of writing hidden messages in such a way that no one, apart from the sender and intend recipient, suspects the existence of the message, a form of security through obscurity. Audio steganography is the scheme of hiding the existence of secret information by concealing it into another medium such as audio file. In this paper we mainly discuss different types of audio steganographic methods, advantages and disadvantages.

KEYWORD

Steganography, Cryptography, Audio Steganography, LSB.

Full Text: **https://aircconline.com/ijma/V3N3/3311ijma08.pdf**

Volume Link: **https://airccse.org/journal/ijma_current11.html**

REFERENCES

[1] W. Bender, W. Butera, D. Gruhl, R. Hwang, F. J. Paiz, S. Pogreb, “Techniques for data hiding”, IBM Systems Journal, Volume 39 , Issue 3-4, July 2000, pp. 547 – 568.

[2] Samir Kumar Bandyopadhyay, Debnath Bhattacharyya, Poulami Das, Debashis Ganguly and Swarnendu Mukherjee, “A tutorial review on Steganography”, International Conference on Contemporary Computing (IC3-2008), Noida, India, August 7-9, 2008, pp. 105-114.

[3] Robert Krenn, “Steganography and steganalysis”, An Article, January 2004.

[4] Nedeljko Cvejic, Tapio Seppben “Increasing the capacity of LSB-based audio steganography ” FIN90014 University of Oulu, Finland ,2002.

[5] Sajad Shirali-Shahreza M.T. Manzuri-Shalmani “High capacity error free wavelet domain speech steganography” ICASSP 2008

[6] Neil F.Johnson, Z.Duric and S.Jajodia. “Information Hiding Steganography and Watermarking-Attacks and Countermeasures”,Kluwer Academic Publishers, 2001

[7] F.A.P.Petitcolas, R.J.Anderson, M.G.Kuhn:”Information Hiding- A Survey”, Process of IEEE, vol.87, no.7, pp.1062-1078, July, 1999.

[8] Min Wu, Bede Liu. “Multimedia Data Hiding”, Springer- Verlag New York, 2003.

[9] N. Taraghi-Delgarm, “Speech Watermarking”, M.Sc. Thesis, Comptuer Engineering Department, Sharif University of Technology, Tehran, IRAN, May 2006.

[10] M. Pooyan, A. Delforouzi, “LSB-based Audio Steganography Method Based on Lifting Wavelet Transform”, in Proc. 7th IEEE International Symposium on Signal Processing and Information Technology (ISSPIT'07), December 2007, Egypt.

[11] R.A. Santosa and P. Bao, “Audio-to-image wavelet transform based audio steganography,” Proc. of 47th Int. Symposium ELMAR, June 2005, pp. 209- 212.

[12] Xuping Huang, Ryota Kawashima, Norihisa Segawa, Yoshihiko Abe. “The Real-Time Steganography Based on Audio-to-Audio Data Bit Stream”,Technical report of IEICE, ISEC, vol.106 pp.15-22, September 2006.

[13] Aoki, Naofumi. ”A Band Widening Technique for VoIP Speech Using Steganography Technology”, Report of IEICE, SP,106(333), pp.31-36, 2006.

[14] Xuping Huang, Ryota Kawashima, Norihisa Segawa, Yoshihiko Abe International Conference on Intelligent “Information Hiding and Multimedia Signal Processing” © 2008 IEEE.

[15] A. Delforouz, Mohammad Pooyan, "Adaptive Digital Audio Steganography Based on Integer wavelet transform ", IEEE Third International Conference on Intelligent Information Hiding and Multimedia Signal Processing, 2007, 26-28 Nov 2007, pp 283-286.

[16] R. A. Santosa, P. Bao," Audio-to-Image Wavelet Transform based Audio Steganography", 47th International Symposium ELMAR-2005 , 08-10 June 2005, Zadar, Croatia, pp 209-212.

[17] S. Shirali-Shahreza, M. T. Manzuri-Shalmani, "Adaptive Wavelet Domain Audio Steganography with High Capacity and Low Error Rate", IEEE International Conference on Information and Emerging Technologies, 2007, 06-07 July 2007 pp 1-5.

[18] Yincheng Qi, Jianwen Fu, and Jinsha Yuan, “Wavelet domain audio steganalysis based on statistical moments of histogram”, Journal of System Simulation, Vol 20, No. 7, pp. 1912-1914, April 2008.

[19] Yin-cheng qi, liang ye, chong liu “Wavelet domain audio steganalysis for multiplicative embedding model” Proceedings of the 2009 International Conference on Wavelet Analysis and Pattern Recognition, Baoding, 12-15 July 2009.

[20] V. Vapnik, “Statistical Learning Theory”, John Wiley, 2008.

[21] Mengyu Qiao, Andrew H. Sung , Qingzhong Liu “Feature Mining and Intelligent Computing for MP3 Steganalysis” International Joint Conference on Bioinformatics, Systems Biology and Intelligent Computing 2009.

AUTHORS

Jayaram P is currently doing his Engineering degree in R V College of Engineering Bangalore. He has published many papers in National Conferences. His areas of research are Networking, Operating Systems, Data Structures, Computer Graphics and Mobile Computing.

Ranganatha H R is currently doing his Engineering degree in R V College of Engineering Bangalore. He has published many papers in National Conferences. His areas of research are Algorithms, Distributed Systems, Network security and Business Intelligence.

Anupama H S is working as an Assistant Professor in R V College of Engg Bangalore. She did B E in S.I.T College of Engg Tumkur and M.Tech in J.N.N.C.E College Shimoga, Karnataka, India. Her research of interest are Security, Steganography, Brain Computer Interface and Virtual Keyboard.

SELECTION SORTING ALGORITHM VISUALIZATION USING FLASH

Hadi Sutopo

Department of Informatics, Universitas Persada Indonesia YAI, Jakarta, Indonesia
hadi@topazart.info

ABSTRACT

This paper is intended to develop an algorithm visualization, particularly selection sorting for an Algorithm and Programming course. Algorithm visualization technology graphically illustrates how algorithms work. This visualization can be used to explain how all data move to the proper position in order to be sorted in a display computer for education. This research consists of 6 steps which are concept, design, obtaining content material, assembly, testing, and distribution. During the testing step, the application is run and checked to confirm that it performs exactly what the author has intended and the students can learn selection sorting algorithm by studying the visualization. Subjects of the research were students at Department of Informatics Universitas Persada Indonesia YAI for implementation of the learning. The data were analysed using the analytic descriptive method and interpreted in a narrative way based on the research findings. The algorithm visualization indicates that students increase their motivation and ability to program variety of sorting in programming language they learn.

KEYWORDS

Multimedia, Algorithm, Sorting, Flash movie, ActionScript

Full Text: https://aircconline.com/ijma/V3N1/3111ijma03.pdf

Volume Link: https://www.airccse.org/journal/ijma_current12.html

REFERENCES

[1] Semiawan, Conny R, (2009) Landasan Pembelajaran dalam Perkembangan Manusia, Jakarta: Center for Human Capacity Development.

[2] Sfenrianto, (2009) "A Model of Adaptive E-Learning System Based on Student's Motivation", Proceedings from ICCIT-09: International Conference on Creative Communication and Innovative Technology, 2009. Tangerang: CCIT Journal.

[3] Sedgewick, Robert , (2001) Algorithms in C++, Third Ediition, Massachusetss: Addison-Wesley

[4] Tenenbaum M, Aaron & Augenstein, Moshe J, (1981) Data Structures Using Pascal, Englewoods Cliffs, Prentice Hall.

[5] Hearn, Donald, and Pauline Baker, (1996) Computer Graphics C Version, 2nd edition. Upper Saddle River, NJ: Prentice Hall International, Inc.

[6] Vaughan, Tay, (2006) Multimedia Making it Work, Yogyakarta: Andi Publisher.

[7] Anleigh, Prabath K & Thakar, Kiran, (1997) Multimedia Systems Design, Upper Saddle River: Prentice Hall.

[8] Bhatnager, Gaurav, Sikha Metha and Sugata Mitra, (2001) Introduction to Multimedia Systems, London: Academic Press.

[9] Luther, Arc C, (1994) Authoring Interactive Multimedia. Boston: AP Professional.

[10] Sutopo, Ariesto H, (2003) Multimedia Interaktif dengan Flash. Yogyakarta: Graha ilmu.

[11] Ypenburg, Derrick, (2009) ActionScript 3.0, Berkeley, CA: Peachpit Press.

[12] Franklin, Derek & Jobe Makar, (2002) Macromedia Flash MX ActionScripting Advanced Training from the Source, Berkeley, CA: Macromedia Press.

[13] Sutopo, Ariesto H, (2003) Integrasi Flash dengan ASP, Jakarta: Elex Media Komputindo.

AUTHORS

Hadi Sutopo was born in Cilacap, Indonesia on April 15, 1945. He is Doctor of Education in Educational Technology of the Jakarta State University, graduated in November 2009. In 1998 he earned Master of Information Systems at Post Graduate Program Gunadarma University, Jakarta. In 1995 he graduated from the Universitas Persada Indonesia YAI. Jakarta, majoring in Informatics.

Hadi is currently a lecturer of Multimedia at the Universitas Persada Indonesia YAI and some other universities in Jakarta, Indonesia since 1998. He wrote many books on multimedia and information technology. The books are Pemrograman Berorientasi Objek dengan Java (Yogyakarta, Indonesia: Graha Ilmu, 1995), Desain Buku dengan Adobe InDesign Jakarta, Indonesia: Elex Media Komputindo, 2006), and Pemrograman Flash dengan PHP dan MySQL (Yogyakarta, Indonesia: Graha Ilmu, 2007). Current interest research is information technology especially multimedia.

Dr. Hadi Sutopo, MMSI is a member of Indonesian Association of Educational Technology (IPTPI) and Association of Education and Communication Technology (AECT). He works in editorial team of Educational Technology Journal and Multimedia Journal in Jakarta, Indonesia.

AN ALTERNATIVE GREEN SCREEN KEYING METHOD FOR FILM VISUAL EFFECTS

Jin Zhi

Department of Creative Professions & Digital Arts, University of Greenwich, United Kingdom

ABSTRACT

This study focuses on a green screen keying method developed especially for film visual effects. There are a series of ways of using existing tools for creating mattes from green or blue screen plates. However, it is still a time-consuming process, and the results vary especially when it comes to retaining tiny details, such as hair and fur. This paper introduces an alternative concept and method for retaining edge details of characters on a green screen plate, also, a number of connected mathematical equations are explored. At the end of this study, a simplified process of applying this method in real productions is also tested.

KEYWORDS

Digital Compositing, Green Screen Keying, Visual Effects

Full Text: **https://aircconline.com/ijma/V7N2/7215ijma01.pdf**

Volume Link: **https://airccse.org/journal/ijma_current15.html**

REFERENCES

[1] Richard, J (1994) “RKO Film Grosses: 1931-1951”, Historical Journal of Film Radio and Television 14, 1, pp55.
[2] GORBACHEV, B. K (1961). Tekhnika kombinirovannykh s’’emok. Moscow, 2nd ed.
[3] Snider., David., Glenn K., Ken C., and Michael M (1993) Digital Moving-Picture Exchange: File Format and Calibration, SMPTE Journal, pp712-714.
[4] Mike. S (2011). The Art of Digital Color. Fxfuide
[5] Mark, C.V., Craig, B (2002). The Invisible Art: The Legends of Movie Matte Painting. Chronicle Books, pp33.
[6] Livingstone, M (2002) The First Stages of Processing Color and Luminance: Where and What. Vision and Art: The Biology of Seeing. New York: Harry N. Abrams, pp46–67.
[7] Chrles, P (2003). Digital Video and HDTV: Algorithms and Interfaces. Morgan-Kaufmann. 24, pp291-292.
[8] Larry, G., and eugene, E (2007). GPU Gems 3. Chapter 24.
[9] Lee, L (2010). Professional Digital Compositing. Wiley Publishing, Inc., Indianapolis, pp47-51.
[10] Hazewinkel, M (2001). Absolute value, Encyclopedia of Mathematics, Springer

AUTHORS

Dr Jin Zhi has a very wide higher education background in tradition art, design and digital moving images, film production as well as film visual effects and 3D CGI. Jin is currently working at Creative Professions & Digital Arts, University of Greenwich. In the past 10 years, Jin worked in various VFX studios including The Moving Picture, London and Cinesite Kodak Visual Effects. Meanwhile, Dr Jin also worked as a visiting lecturer in a number of universities in the UK as well as South Korea such as University of Westminster, London and Konkuk University in Seoul, South Korea. As a film VFX Compositor, Jin’s visual effects works are included in following commercial feature films: Prometheus (2012), Wrath of the Titans (2012), John Carter (2012), Harry Potter and the Deathly Hallows: Part 2 (2012). Jin’s expertise and research interests widely covered in different areas in film & television post-production, especially film digital compositing, film & TV visual effects productions, creating 3D CG elements for feature films as well as digital moving image design, etc. In addition, Dr Jin has been certified as a Nuke Trainer by the Foundry UK in 2015.

GAMIFICATION ELEMENTS AND THEIR IMPACTS ON TEACHINGAND LEARNING – A REVIEW

Mohd Hishamuddin Abdul Rahman, Ismail @ Ismail Yusuf Panessai,Noor Anida Zaria Mohd Noor and Nor Syazwani Mat Salleh
Department of Computing, Faculty of Art, Computing & Creative Industry,Universiti PendidikanSultan Idris, Tanjung Malim, Perak, Malaysia

ABSTRACT

This paper discusses the results of a literature review to identify the elements of gamification in learning that have been applied in previous studies and their impacts on student learning, with only taking into account the related studies within the last three years (2016 to 2018). This is done to determine the most effective and suitable elements of gamification to be applied in our study and at the same time to identify research gaps that need to be fulfilled in future researches. The results of this review show that gamification has positive impact on student learning particularly in their engagement and achievement. Furthermore points, leaderboard and digital badge are the most applied gamification elements in the studies. The findings will be used as a guide for us in designing a gamified collaborative learning activities in the 3-dimensional virtual world that will becarried out later.

KEYWORDS

Gamification, Game-based Learning, Virtual World

Full Text: https://aircconline.com/ijma/V10N6/10618ijma04.pdf

Volume Link: https://www.airccse.org/journal/ijma_current18.html

REFERENCES

[1] Dicheva, D., Dichev, C., Agre, G., & Angelova, G. (2015). Gamification in education: A systematic mapping study. Journal of Educational Technology & Society, 18(3), 9.

[2] Vlachopoulos, D., & Makri, A. (2017). The effect of games and simulations on higher education: a systematic literature review. International Journal of Educational Technology in Higher Education, 14(1), 22.

[3] Google Trend (2017). Game-based learning. Retrieved from https://trends.google.com/trends/ explore? date=today%205-y&q=gamebased%20 learning.

[4] Hoe, T. W. (2015). Gamifikasi dalam pendidikan: Pembelajaran berasaskan permainan. Tanjong Malim: Universiti Pendidikan Sultan Idris.

[5] Tsay, C. H. H., Kofinas, A., & Luo, J. (2018). Enhancing student learning experience with technology-mediated gamification: An empirical study. Computers & Education, 121, 1-17.

[6] Alsawaier, R. S. (2018). The effect of gamification on motivation and engagement. The International Journal of Information and Learning Technology, 35(1), 56-79.

[7] Chan, K. Y. G., Tan, S. L., Hew, K. F. T., Koh, B. G., Lim, L. S., & Yong, J. C. (2017). Knowledge for games, games for knowledge: designing a digital roll-and-move board game for a law of torts class. Research and Practice in Technology Enhanced Learning, 12(1), 7.

[8] Sepehr, S., & Head, M. (2013, October). Competition as an element of gamification for learning: an exploratory longitudinal investigation. In Proceedings of the First International Conference on Gameful Design, Research, and Applications (pp. 2-9). ACM.

[9] Szegletes, L., Koles, M., & Forstner, B. (2015). Socio-cognitive gamification: general framework for educational games. Journal on Multimodal User Interfaces, 9(4), 395-401.

[10] Alexiou, A., & Schippers, M. C. (2018). Digital game elements, user experience and learning: A conceptual framework. Education and Information Technologies, 1-23.

[11] Cózar-Gutiérrez, R., & Sáez-López, J. M. (2016). Game-based learning and gamification in initial teacher training in the social sciences: an experiment with MinecraftEdu. International Journal of Educational Technology in Higher Education, 13(1), 2.

[12] González, C. S., Gómez, N., Navarro, V., Cairós, M., Quirce, C., Toledo, P., & Marrero- Gordillo, N. (2016). Learning healthy lifestyles through active videogames, motor games and the gamification of educational activities. Computers in Human Behavior, 55, 529-551.

[13] Hew, K. F., Huang, B., Chu, K. W. S., & Chiu, D. K. (2016). Engaging Asian students through game mechanics: Findings from two experiment studies. Computers & Education, 92, 221-236

[14] Pesare, E., Roselli, T., Corriero, N., & Rossano, V. (2016). Game-based learning and gamification to promote engagement and motivation in medical learning contexts. Smart Learning Environments, 3(1), 5.

[15] Spires, H. A., & Lester, J. C. (2016). Game-based learning: creating a multidisciplinary community of inquiry. On the Horizon, 24(1), 88-93.

AUTHORS

Dr. Mohd Hishamuddin Abdul Rahman is a senior lecturer at the Faculty of Art, Computing & Creative Industry, Universiti Pendidikan Sultan Idris (UPSI). His research interests are towards educational technology, multimedia, virtual learning environment, game-based learning and gamification, virtual and augmented reality and also on new media in teaching and learning.

Dr. Ismail @ Ismail Yusuf Panessai is a senior lecturer at the Faculty of Art, Computing & Creative Industry, Universiti Pendidikan Sultan Idris (UPSI). His research interests are towards Artificial Intelligence, Artificial Intelligence in education, VRP and Control System.

Dr. Noor Anida Zaria Binti Mohd Noor is a senior lecturer at the Faculty of Art, Computin g & Creative Industry, Universiti Pendidikan Sultan Idris (UPSI). Her research interests are towards Information Technology, Knowledge Management, Knowledge Integration and Project Management.

Dr. Nor Syazwani Binti Mat Salleh is a senior lecturer at the Faculty of Art, Computing & Creative Industry, Universiti Pendidikan Sultan Idris (UPSI). Her research interests are towards ICTs in Education, Art & Design, Graphic Design and Personalized Learning.

AN EVALUATION OF THE USE OF AUDIO GUIDANCE IN AUGMENTED REALITY SYSTEMS IMPLEMENTED AT SITES OF CULTURAL HERITAGE

Benjamin Wilson, Joshua Hull and Damian Schofield

Department of Computer Science, State University of New York, Oswego, New York, 13126, USA

ABSTRACT

Recently, museums and historic sites have begun reaching out beyond their traditional audience groups, using more innovative digital display technology to find and attract a new audience. Virtual, mixed, and Augmented Reality (AR) technologies are becoming more ubiquitous in our society and "virtual history" exhibits are starting to be available to the public. There are numerous studies focusing on AR, however a scant amount of research is being done at historical sites. An initial experiment used repeated measures (ANOVA) to compare and rank three different types of AR devices used at a site of cultural heritage. A further experiment was then undertaken to observe participants using two different AR devices with and without sound to determine if which device used or the presence of sound impact the usability of the device, or the user's satisfaction/preference of specific devices. Several surveys, including demographic and
usability surveys, were provided in order to collect a range of user data. A two-way repeated measures (ANOVA) were used to analyze the quantitative data gathered. No significant effects were observed based on the quantitative data provided by the surveys, indicating that all devices were equally usable and satisfactory, and that sound did not have a significant impact in this instance. However, the qualitative data indicated that users may prefer using AR technology on a smartphone device and preferred to use this device paired with sound.

KEYWORDS

Augmented Reality, Audio Guide, Cultural Heritage, Human Computer Interaction (HCI), Usability

Full Text: **https://aircconline.com/ijma/V14N2/14222ijma01.pdf**

Volume Link: **https://airccse.org/journal/ijma_current22.html**

REFERENCES

[1] C. Yoon (2018) “Assumptions that led to the failure of Google Glass”, NYC-Design.
[2] P. A. Rauschnabel (2018) “Virtually enhancing the real world with holograms: An exploration of expected gratifications of using augmented reality smart glasses”, Psychology & Marketing, 35(8), 557-572.
[3] D. Schofield, T. Johnson, D. Hufnal, P. Chapagain, S. Colletta, and P. Lear (2021) “Augmenting cultural experience : Evaluating the use of augmented reality technology to enhance the visitor experience at a historic site”, Journal of Studies in Social Sciences and Humanities 7 (2) 129-145
[4] D. Ivancic, D. Schofield, and L. Dethridge (2013) “The effects of perspective and presentation: User experience in a virtual art gallery”, International Journal of Computer Research, 20(1) 53-77.
[5] S. Sharples, S. Cobb, A. Moody, and J. R. Wilson (2008) “Virtual reality induced symptoms and effects (VRISE): Comparison of head mounted display (HMD)”, desktop and projection display systems. Displays, 29(2) 58-69.
[6] Y. A. A. Pizarro, A. A. De Salles, S. Severo, J. L. Garzón, and S. M. R. Bueno (2014) “Specific Absorption Rate (SAR) in the head of Google glasses and Bluetooth user's”, In IEEE Latin-America Conference on Communications (LATINCOM), 1-6.
[7] D. Wagner, T. Pintaric, F. Ledermann, and D. Schmalstieg (2005) “Towards massively multi-user augmented reality on handheld devices”, In International Conference on Pervasive Computing, Springer, Berlin, Heidelberg, 208-219.
[8] P. Walsh (2020) “Innovative Technology Is The Future Of Education”, Forbes, July.
[9] P. Vate-U-Lan, (2012, July). An augmented reality 3d pop-up book: the development of a multimedia project for English language teaching. In IEEE International Conference on Multimedia and Expo (2012) 890-895.
[10] J. L. Soler, J. Ferreira, M. Contero, and M. Alcañiz (2017) “The power of sight: using eye tracking to assess learning experience in virtual reality environments”, In Proceedings of INTED2017, 8684- 8689.
[11] W. S. Khor, B. Baker, K. Amin, A. Chan, K. Patel, and J. Wong (2016) “Augmented and virtual reality in surgery - the digital surgical environment: applications, limitations and legal pitfalls”, Annals of Translational Medicine, 4(23).
[12] J. Carmigniani, B. Furht, M. Anisetti, P. Ceravolo, E. Damiani, and M. Ivkovic (2011) “Augmented reality technologies, systems and applications. Multimedia Tools and Applications”, 51(1) 341-377.
[13] T. P. Caudell, and D. W. Mizell (1992) “Augmented reality: an application of heads-up display technology to manual manufacturing processes”, In Proceedings of the Twenty-Fifth Hawaii International Conference on System Sciences, IEEE, Vol. 2 659-669.
[14] Q. M. Bui, T. N. Le, V. T. Nguyen, M. T. Tran, and A. D. Duong (2012) “Applying fast planar object detection in multimedia augmentation for products with mobile devices”, In 4th International Conference on Intelligent Human-Machine Systems and Cybernetics, IEEE, Vol. 2 292-297.
[15] B. B. Bederson (1995) “Audio augmented reality: a prototype automated tour guide”, In Conference Companion on Human Factors in Computing Systems, 210-211.
[16] R. T. Azuma (1997) “A survey of augmented reality. Presence: Teleoperators and Virtual \Environments”, 6(4) 355-385.
[17] S. Feiner, B. MacIntyre, T. Höllerer, and A. Webster (1997) “A touring machine: Prototyping 3D mobile augmented reality systems for exploring the urban environment”, Personal Technologies, 1(4) 208-217.
[18] G. Reitmayr, and D. Schmalstieg (2021)” Mobile collaborative augmented reality”, In Proceedings IEEE and ACM International Symposium on Augmented Reality, 114-123.
[19] H. Kaufmann, and D. Schmalstieg (2002) “Mathematics and geometry education with collaborative augmented reality”, In ACM SIGGRAPH 2002 Conference Abstracts and Applications, 37-41.
[20] M. Mohring, C. Lessig, and O. Bimber (2004) “Video see-through AR on consumer cell-phones”, In Third IEEE and ACM International Symposium on Mixed and Augmented Reality, 252-253.
[21] A. Henrysson, M. Billinghurst, and M. Ollila (2005) “Face to face collaborative AR on mobile phones”, In Fourth IEEE and ACM International Symposium on Mixed and Augmented Reality, 80-89.
[22] R. M. Yilmaz, and Y. Goktas, Y. (2017) “Using augmented reality technology in storytelling activities: examining elementary students’ narrative skill and creativity”, Virtual Reality, 21(2) 75-89.
[23] T. Chandrasekera, and S. Y. Yoon (2018) “Augmented Reality, Virtual Reality and Their Effect onLearning Style in the Creative Design Process”, Design and Technology Education, 23(1).
[24] A. Ruiz-Ariza, R. A. Casuso, S. Suarez-Manzano, and E. J. Martínez-López (2018) “Effect of augmented reality game Pokémon GO on cognitive performance and emotional intelligence in adolescent youth”, Computers and Education, 116 49-63.
[25] J. M. Harley, E. G. Poitras, A. Jarrell, M. C. Duffy, and S. P. Lajoie, S. P. (2016) “Comparing virtual and location-based augmented reality mobile learning: emotions and learning outcomes”, Educational Technology Research and Development, 64(3), 359-388.
[26] C. Suso-Ribera, J. Fernández-Álvarez, A. García-Palacios, H. G. Hoffman, J. Bretón-López, R. M. Banos, and C. Botella (2019) “Virtual reality, augmented reality, and in vivo exposure therapy: a preliminary comparison of treatment efficacy in small animal phobia”, Cyberpsychology, Behavior, and Social Networking, 22(1) 31-38.
[27] C. F. Tsai, S. C. Yeh, Y. Huang, Z. Wu, J. Cui, and L. Zheng (2018) “The effect of augmented reality and

virtual reality on inducing anxiety for exposure therapy: a comparison using heart rate variability", Journal of Healthcare Engineering, 1-8.
[28] D. Mouraux, E. Brassinne, S. Sobczak, A. Nonclercq, N. Warzée, P. S. Sizer, and B. Penelle (2019) "3D augmented reality mirror visual feedback therapy applied to the treatment of persistent, unilateral upper extremity neuropathic pain: a preliminary study", Journal of Manual & Manipulative Therapy, 25(3) , 137-143.
[29] P. A. Rauschnabel, R. Felix, and C. Hinsch (2019) "Augmented reality marketing: How mobile ARapps can improve brands through inspiration", Journal of Retailing and Consumer Services, 49 ,43- 53.
[30] T. Hilken, K. de Ruyter, M. Chylinski, D. Mahr, and D. I. Keeling (2017) "Augmenting the eye of the beholder: exploring the strategic potential of augmented reality to enhance online service experiences", Journal of the Academy of Marketing Science, 45(6), 884-905.
[31] R. Yung, and C. Khoo-Lattimore (2019) "New realities: a systematic literature review on virtual reality and augmented reality in tourism research", Current Issues in Tourism, 22(17) 2056-2081.
[32] D. I. Han, M. C. Dieck, and T. Jung, T (2018) "User experience model for augmented reality applications in urban heritage tourism", Journal of Heritage Tourism, 13(1) ,46-61.
[33] C. D. Kounavis, A. E. Kasimati, and E. D. Zamani (2012) "Enhancing the Tourism Experience through Mobile Augmented Reality: Challenges and Prospects", International Journal of Engineering Business Management, 4 ,10.
[34] A. Tomiuc (2012) "Navigating Culture. Enhancing Visitor Museum Experience through Mobile Technologies. From Smartphone to Google Glass", Journal of Media Research-Revista de Studii Media, 7(3:20) 33-46.
[35] T. Jung, M. C. Dieck, H. Lee, and N. Chung, Effects of virtual reality and augmented reality on visitor experiences in museum. Information and Communication Technologies in Tourism, (2016) 621-635.
[36] C. Edwards (2013) "Better than Reality?", Engineering and Technology, 8(4) 28-31.
[37] K. D. Johnson, J. C. Díaz, and R. B. Pickering (2012) "Virtual Tours for Museum Exhibits. Proceedings of Electronic Visualisation and the Arts Conference", (EVA 2012), London, UK, 100- 106.
[38] D. Tsichritzis and S. J. Gibbs (1991) "Virtual Museums and Virtual Realities", In proceedings of the International Conference on Hypermedia and Interactivity in Museums, 17-25.
[39] C. Lin-Hendel(2009) "System and method for constructing and displaying active virtual reality cyber malls, show rooms, galleries, stores, museums, and objects within", (United States Patent No. US7574381B1).
[40] S. A. Yoon and J. Wang (2014) "Making the invisible visible in science museums through augmented reality devices", TechTrends, 58(1) 49-55.
[41] A. Damala, P. Cubaud, A. Bationo, P. Houlier, and I. Marchal (2008) "Bridging the gap between the digital and the physical: design and evaluation of a mobile augmented reality guide for the museum visit", Proceedings of the 3rd International Conference on Digital Interactive Media in Entertainment and Arts, ACM, 120 - 127.
[42] S. Sylaiou, A. Karoulis, Y. Stavropoulos, and P. Patias, (2008) "Presence-Centered Assessment of Virtual Museums' Technologies", DESIDOC Journal of Library and Information Technology, 28(4), 55–62.
[43] M. T. Yang and W. C. Liao, W. C. (2014) "Computer-assisted culture learning in an online augmented reality environment based on free-hand gesture interaction" IEEE Transactions on Learning Technologies, 7(2) 107-117.
[44] N. Ghouaiel, S. Garbaya, J. M. Cieutat, and J. P. Jessel (2017) "Mobile Augmented Reality in Museums: Towards Enhancing Visitor's Learning Experience", International Journal of Virtual Reality, 17(1) 21–31.
[45] M. Ding (2017) "Augmented reality in museums, Museums & augmented reality–A collection of essays from the arts management and technology laboratory", 1-15.
[46] M. C. T. Dieck, T. Jung and D. Han (2016) "Mapping requirements for the wearable smart glasses augmented reality museum application", Journal of Hospitality and Tourism Technology, 7(3) 230- 253.
[47] P. A. Rauschnabel (2018) "Virtually enhancing the real world with holograms: An exploration of expected gratifications of using augmented reality smart glasses", Psychology and Marketing, 35(8) 557-572.
[48] National Historic Landmarks Program (U.S. National Park Service). (2018, August 29). Retrieved July 8, 2020, from https://www.nps.gov/orgs/1582/index.htm
[49] B. K. Seo, K. Kim, and J. I. Park (2010) "Augmented reality-based on-site tour guide: a study in Gyeongbokgung", In Proceedings of Asian Conference on Computer Vision, Springer, Berlin, Heidelberg 276-285.
[50] R. E. Bell, Fort Ontario, New York. On Point, 22(4) (2017) 46-49.
[51] NRIS (National Register Information System), (2010) National Register of Historic Places. National Park Service.
[52] F. Tscheu, and D. Buhalis (2016) "Augmented reality at cultural heritage sites", Information and Communication Technologies in Tourism, 607-619.

[53] T. Gjøsæter, Affordances in Mobile Augmented Reality Applications. International Journal of Interactive Mobile Technologies, 8(4) (2014) 45-55.
[54] E. Cranmer, and T. Jung (2014) "Augmented reality (AR): Business models in urban cultural heritage tourist destinations", Proceedings of APacCHRIE Conference, Malaysia, 21-24.
[55] J. R. Lewis (1995) "IBM computer usability satisfaction questionnaires: psychometric evaluation and instructions for use", International Journal of Human-Computer Interaction, 7(1) 57-78.
[56] N. Singh, S. Srivastava, and N. Sinha (2017) "Consumer preference and satisfaction of M-wallets: a study on North Indian consumers", International Journal of Bank Marketing.
[57] A. Poushineh, and A. Z. Vasquez-Parraga (2017) "Discernible impact of augmented reality on retail customer's experience, satisfaction and willingness to buy", Journal of Retailing and Consumer Services, 34 229-234.
[58] U. C. Pendit, S. B. Zaibon, and J. A. Bakar (2014) "Mobile augmented reality for enjoyable informal learning in cultural heritage site", International Journal of Computer Applications, 92(14) 19-26.
[59] A. Härmä, J. Jakka, M. Tikander, M. Karjalainen, T. Lokki, J. Hiipakka, and G. Lorho, (2004) "Augmented reality audio for mobile and wearable appliances", Journal of the Audio Engineering Society, 52(6) 618-639.
[60] S. H. Halili, (2019) "Technological advancements in education" 4.0. The Online Journal of Distance Education and e-Learning, 7(1) 63-69.

AUTHORS

Benjamin Wilson recently completed a masters degree in Human-Computer Interaction from the State University of New York at Oswego.

Joshua Hull recently completed a masters degree in Human-Computer Interaction from the State University of New York at Oswego.

Damian Schofield is a full professor and director of the Human-Computer Interaction masters program at the State University of New York at Oswego

REVIEW OF BLACK HOLE AND GREY HOLE ATTACK

Rupinder Kaur[1] and Parminder Singh[2]

[1]Student, IT Deptt, CEC, Landran, Mohali, India
[2]Assit.Professor, IT Deptt, CEC, Landran, Mohali, India

ABSTRACT

Black hole and Grey hole attack is most happening attacks in Mesh networks. Mesh networks means nonstatic networks with making loops of networks with the help of active hotspots. In Wireless networks all the communication between the nodes is happening wirelessly and the nodes are so much resource constraint that it is difficult to employ any security solutions of other ad hoc networks. So they are attacked by malicious nodes. In black hole attack the attacker windup all the information and dropped it. In black hole attack, the series of RREQ (route request) and RREP (route reply) follows the smallest way of networking communication. The fault node always transmit RREP message as it receives RREQ, while managing the receivers sequence number. By the help of fault node packets are dropped. Sometimes fault node is authorised and otherwise it is unauthorised. Black hole attack is type of routing attack and can bring harm to whole network. Grey hole attack is the kind of denial of service attack. In this attack, the router which is mesh behave just not well and a subset of packets are forward and handle by receiver but leave by others. The presences of these attackers are hard to detect in wireless networks because over the wireless link the packets are lost due to bad channel quality. This paper deals with the study of analysis of delay occurs by these attack in Wireless Mesh networks and its types and also discuss about previous study by which we get idea about attack occurs in networks and also study various techniques to detect and prevent network from black hole and grey hole attack. Then we discuss about their result by using simulator OPNET.

KEYWORDS

Black hole attack, Grey hole attack, MRP, OLSR, RREQ, RREP, RERR, OPNET.

Full Text: **https://aircconline.com/ijma/V6N6/6614ijma03.pdf**

Volume Link: **https://airccse.org/journal/ijma_current14.html**

REFERENCES

[1] A.Patcha, A.Mishra, "Collaborative Security architecture of black hole attack prevention in mobile ad hoc networks[C]",Radio and Wireless Conference,2003,pp.75-78

[2] B. Sun, Y. Guan, ,J. Chen ,U.W Pooch, "Detecting Black hole attack In Mobile Ad-hoc Netwoks[C]".5th Europeen Personel Mobile Communications Conference,2003,pp. 490-495.

[3] C. Karlof, D.Wagner, "Secure routing in wireless sensor networks: Attacks and countermeasures, Special Issue on Sensor Network Applications and Protocols", vol 1 (2-3), 2003,pp.1293 –1303

[4] Dr. A. A. Gurjar, Professor, Department Of Electronics & Telecommunication, Sipna's C.O.E.T, Amravat and A. A. Dande, Second Year (M.E.), Computer Engineering, Sipna's C.O.E.T, Amravat "
Black Hole Attack in Manet's: A Review Study" International Journal of IT, Engineering and Applied Sciences Research (IJIEASR) ISSN: 2319-4413 Volume 2, No. 3, March 2013,pp. 12-14.

[5] D.Djen, L. Khelladi, and A.N. Badache, "A survey of of Security issues in Mobile Ad Hoc Network," Communication Surveys & Tutorials , IEEE,vol. 7 no. 4, ,pp. 2-28,2005.

[6] D.Boneh,C.Gentry,B.Lynn,H.Shachem,"Aggregate and Verifiably Encrypted Signature from Bilineer Maps ",Advances in Cryptology-EUROCRYPT'03,LNCS 2656,Berlin,Spinger-Veralg,2003,pp.416- 432.

[7] Dr.Parminder Singh,Damanpreet Kaur," Approach to Improve the Performance of WSN during Wormhole Attack using Promiscuous Mode", volume 73,international journal of computer application, july 2013,pp 26-29.

[8] Elizabeth M. Royer, and Chai-Keong Toh, "A Review of Current Routing Protocols for Ad Hoc Mobile Wireless Networks," IEEE Personal Communications, April 1999, pp. 46-55.

[9] F.Stanjano, R.Anderson, "The Resurrecting Duckling: Security Issues for Ubiquitous Computing," Vol. 35, Apr, 2002, pp. 22-26.

[10] Hesiri Itserasinghe and Huirong Fu,"Preventing Cooperative Black Hole Attacks in Mobile Ad Hoc Networks", International Journal of Software Engineering and Its Applications,Vol. 2, No. 3, July, 2008,pp.39-54.

[11] H. Deng, W. Li, and D. P. Agrawal. "Routing Security in Adhoc Networks." In: IEEE Communications Magazine, Vol. 40, No. 10, Oct. 2002,pp. 70-75.

[12] Hongmei Deng, Itsi Li, and Dharma P. Agrawal, "Routing Security in Wireless Ad Hoc Network," IEEE Communications Magzine, vol. 40, no. 10, October 2002,pp70-75.

[13] J. Cai, P. Yi, J. Chen, Z. Wang, N. Liu, An adaptive approach to detecting black and Grey hole attacks in ad hoc network, in: 4th IEEE International Conference on Advanced Information networking and Applications, IEEE Computer Society, 2010, pp.775–780.

[14] JiItsn CAI, Ping YI, Jialin CHEN, Zhiyang WANG, Ning LIU, "An adaptive approach to detecting black and Grey hole attacks in Adhoc networks",24th IEEE International Conference on Advanced Information networking and application,2010,pp.775-891.1.

[15] K. S. Win, "Analysis of detecting wormhole attack in wireless networks," vol. 48, 2008, pp. 422–428.

[16] Latha Tamilselvan,V Sankaranarayanan,"Prevention Of Blackhole Attack in MANET",In proceeding of 3nd International Conference on Wireless Broadband and Ultra Wideband Communication, Aug 2007,pp.21-21

[17] M. A. Shurman, S. M. Yoo, and S. Park, "Black hole attackin wireless ad hoc networks," in ACM 42nd Southeast Conference (ACMSE'04), Apr. 2004, pp. 96-97.

[18] N. H. Mistry, D. C. Jinwala and M. A. Zaveri,"MOSAODV: Solution to Secure AODV against Black hole Attack", (IJCNS) International Journal of Computer and Network Security, Vol. 1, No. 3, December 2009.pp.42-45.

[19] O. Kachirski and R. Guha, "Effective intrusion detection using multiple sensors in wireless ad hoc networks", In Proceedings of the 36th Hawaii International Conference on System Sciences,2003, pp.57-61.

[20] R.Agrawal, R. Tripathi, S. Tiwari, "Performance evaluation and comparison of aodv and dsr under adversarial environment", International Conference on Computational Intelligence and Communication Networks, IEEE Computer Society, 2011, pp.596–600.

[21] R.H.Jhaveri, S.J.Patel, D. Jinwala, "A novel approach for Greyhole and blackhole attacks in mobile ad hoc networks", Second International Conference on Advanced Computing and Communication Technologies, IEEE Computer Society, 2012, pp. 556–560.

[22] Satoshi Kurosawa, Hidehisa Nakayama, Nei Kato, Abbas Jamalipour, and Yoshiaki Nemoto. "Detecting Blackhole Attack on AODV based Mobile Ad hoc networks by Dynamic Learning Method". International Journal of Network Security, Vol.5, No.3,Nov 2007, pp.338–346.

[23] W. Heinzelman, A. Chandrakasan, H. Balakrishnan, "Energy efficient communication protocol for wireless microsensor networks",IEEE Transactions on Wireless Communications ,vol 1 (4) ,2002,pp. 660–670.

[24] X.P.Geo,W.Chen,"A Novel Grey hole Attack Detection Scheme for Mobile Adhoc Networks[C]",IFIP International Conference On Network and Parallel Computin Workshop,2007,pp. 209-214.

[25] Xiaoyan Hong, Kaixin Xu, and Mario Gerla, “Scalable Routing Protocols for Mobile Ad hoc Networks,” IEEE Network,Vol.16(4),July/August2002,pp.11-21.
[26] Y. A. Huang and W. Lee, “Attack analysis and detection for ad hoc routing protocols,” in The 7th International Symposium on Recent Advances in Intrusion Detection (RAID’04), pp. 125-145, French Riviera, Sept. 2004.
[27] Y. Zou, K. Chakrabarty, “Sensor deployment and target localization based on virtual forces”, TItsnty- Second Annual Joint Conference of the IEEE Computer and Communications Societies, Vol. 2, IEEE Computer Society, 2003, pp. 1293–1303.
[28] Y. Law, P. J. Havinga, “how to secure sensor network”, International Conference on Sensor Networks and Information Processing, IEEE Computer Society, 2010, pp. 89–95.
[29] Y.-C. Hu, D.B. Johnson, and A. Perrig, “SEAD: Secure Efficient Distance Vector Routing for Mobile Wireless Ad hoc Networks,” Proc.4th IEEE Workshop on Mobile Computing Systems and Applications, Callicoon, NY, June 2002, pp. 3-13.

ANALYTIC OF CHINA CYBERATTACK

Robert Lai, CISSP-ISSAP, ISSEP, CAP, CEH, CSSLP[1] and Syed (Shawon) Rahman, Ph.D.[21]School of Business & Technology, Capella University, Minneapolis, MN 55402,[2]Assistant Professor, University of Hawaii-Hilo, Hilo, USA and Adjunct Faculty, Capella University,

ABSTRACT

China cyberattack has become aggressive, disruptive, stealthy, and sophisticated. Apparently, China's advantage is more on the cognitive domain than technical domain since information systems security is art and science—in some case, it is more art than science. Knowledge is the best weapon for cyber warfare since one of the Sun Tze's Art of War principles is "know your enemy". Therefore, an analytic of China cyberattack must scrutinize the national interest, goals and philosophies, culture, worldview, and behavioral phenomena of China.

KEYWORDS

China, Cyberattack, Cyberattack, Analytic, Strategic Advantage, Information Warfare

Full Text: https://aircconline.com/ijma/V4N3/4312ijma04.pdf

Volume Link: https://www.airccse.org/journal/ijma_current12.html

REFERENCES

[1]. J. Arquilla and D. Ronfeldt, "Cyberwar is Coming!," 1993. [Online]. Available:http://www.rand.org/pubs/reprints/RP223/. [Accessed: 28-Apr-2012].
[2]. T. Galdi, "CRS 95-1170F: Revolution in Military Affairs?," 11-Dec-1995. [Online]. Available: http://www.fas.org/man/crs/95-1170.htm. [Accessed: April 11, 2012].
[3]. L. Kamienski, "The RMA and War Powers," Strategic Insights, vol. 2, no. 9, 2003.
[4]. B. Krekel, "Capability of the People's Republic of China to Conduct Cyber Warfare and Computer Network Exploitation," DTIC Document, 2009.
[5]. J. E. Bruzdzinski, "Demystifying Shashoujian: China's 'Assassin's Mace' Concept," Sep-2004.[Online].Available: http://www.mitre.org/work/best_papers/04/bruzdzinski_demystify/bruzdzinski_demystify.pdf.
[6]. E. Talmadge, "Chinese Missile Could Shift Pacific Power Balance," 06-Aug-2010. [Online]. Available: http://www.csmonitor.com/From-the-news-wires/2010/0806/Chinese- Missile-could-shift-Pacific-power-balance. [Accessed: May 11, 2012].
[7]. D. D. Clark and S. Landau, "Untangling Attribution," 2010. [Online]. Available: http://www.nap.edu/openbook.php?record_id=12997&page=25. [Accessed: 11-Dec-2011]. [8]. K. Coleman, "Defense Tech: China's Cyber Forces," 08-May-2008. [Online]. Available: http://defensetech.org/2008/05/08/chinas-cyber-forces/. [Accessed: May 20, 2012].
[9]. B. Engelmann and P. Cordaro, Eds., Cyber Commander's Handbook. 2010.
[10].D. Sevastopulo, "Hackers breach White House system," Financial Times, United Kingdom, London (UK), p. 6, 2008.
[11].J. Rogin, "The Top 10 Chinese Cyber Attacks (that we know of)," 22-Jan-2010. [Online]. Available: http://thecable.foreignpolicy.com/posts/2010/01/22/the_top_10_chinese_cyber_attacks_that_ we_know_of.
[12].T. Greene, "Chinese Hack on U.S. Chamber of Commerce Went Undetected for 6 Months,"21-Dec-2011.[Online].Available: http://podcasts.infoworld.com/d/security/chinese-hack-us-chamber-commerce-wentundetected-6-months-182435?_kip_ipx=816219059-1326849376&source=rss_security. [Accessed: 18-Jan-2012].
[13].G. Smith, "Chinese Hackers Used 'Spear Phishing' To Attack U.S. Chamber Of Commerce,"21-Dec-2011.[Online]. Available: http://www.huffingtonpost.com/2011/12/21/chinese-hackers_n_1163524.html.
[14]."US Chamber of Commerce Hit by Chinese Hackers," 21-Dec-2011. [Online]. Available: http://thehackernews.com/2011/12/us-chamber-of-commerce-hit-by-chinese.html. [Accessed: 1/18/2012].
[15].M. Riley and J. Walcott, "China-Based Hacking of 760 Companies Shows Cyber Cold War,"14-Dec-2011.[Online].Available:http://www.bloomberg.com/news/2011-12- 13/china-based-hacking-of-760-companiesreflects-undeclared-global-cyber-war.html. [Accessed: 24-Jan-2012].
[16].J. Kirk, "iBahn, Supplier of Hotel Internet Services, Denies Breach," 15-Dec-2011. [Online]. Available: http://www.networkworld.com/news/2011/121511-ibahn-supplier-of- hotel-internet-254110.html.

THE IMPACT OF VR GRAPHICAL USER INTERFACE ON OCULUS TOUCH CONTROLLER AND OCULUS RIFT

Natchaphak Meeusah and Bennapa Pattanapipat

Multimedia Technology, Faculty of Mass Communication Technology, Rajamangala University of Technology Thanyaburi, Thailand

ABSTRACT

It is undeniably true that Virtual Reality (VR) has continuously been developed since 1800s and still have been produced till today. However, very few studies have attempted to study on the design of Virtual Reality Graphical User Interface (VR-GUI) that effectively empowers users to interact and immerse in a simulated world, via hardware and software with ease. Therefore, the aims of this research are to compare four different types of VR GUI Controller designs including (2D, 2D animation, 3D, and 3D animation) and to determine UI response time of the Oculus Touch Controller and compare the results with UI response time of Oculus Rift to determine what VR GUI is appropriate for which ages. 168 participants were purposely selected, aged from 12 to 17, 18 to 33, and 34 to 45. The experiment results showed that VR GUI had a significant impact on UI response time resulted from different types of VR GUI controllers. Last but not least, analysis of VR GUI controller user data had suggested that VR GUI developers should design appropriate VR GUI controllers that match all age groups in order for them to experience a fully immersive, perceptually real environment as quickly and efficiently as possible.

KEYWORDS

VR GUI, Oculus Touch Controller, Oculus Rift, Virtual Reality, Generation, Interactive.

Full Text: **https://aircconline.com/ijma/V13N6/13621ijma03.pdf**

Volume Link: **https://airccse.org/journal/ijma_current21.html**

REFERENCES

[1] Zuckerberg, M. (2015) The future of connection. Presented at Facebook F8', Facebook's Developerconference, 25 March, 2015. Available at Internet: https://bit.ly/3CJqhcC [2021-02-11]

[2] Dorabjee, R., Bown, O., Sarkar, S., & Tomitsch, M. (2015). Back to the future: identifying interface trends from the past, present and future in immersive applications. In Proceedings of the Annual Meeting of the Australian Special Interest Group for Computer Human Interaction (pp. 540-544).

[3] Bowman, D.A. (2013). 3D user Interfaces Bruno, F., & Muzzupappa, M. (2010). Product interface design: A participatory approach based on virtual reality. International journal of human-computer studies, 68(5), 254-269.

[4] Norman, D. A. (2010). Natural user interfaces are not natural. interactions, 17(3), 6-10.

[5] Fröjdman, S. (2016). User experience guidelines for design of virtual reality graphical user interfaces controlled by head orientation input. Bachelor Degree Project in Cognitive Science, University of Skövde, Sweden (pp. 58).

[6] Molina, J. P., González, P., Lozano, M. D., Montero, F., & López-Jaquero, V. (2003). Bridging the gap: developing 2D and 3D user interfaces with the IDEAS methodology. In International Workshop on Design, Specification, and Verification of Interactive Systems. Springer, Berlin, Heidelberg, (pp.303-315)

[7] Nielsen, J. (1995) Ten Usability heuristics. Nielsen Norman Group [website], January 1, 1995. Available at Internet: https://bit.ly/3jDwQ8d [2021-02-11]

[8] Bowman, D.A ., Coquillart, S., (2008) 3D user interfaces: new directions and perspectives. IEEE Computer Graphics and Applications, 28(6), 20-36.

[9] Seibert, J., & Shafer, D. M. (2018). Control mapping in virtual reality: effects on spatial presence and controller naturalness. Virtual Reality, 22(1), 79-88.

[10] Bruno, F., & Muzzupappa, M. (2010). Product interface design: A participatory approach based on virtual reality. International journal of human-computer studies, 68(5), 254-269.

[11] Salomoni, P., Prandi, C., Roccetti, M., Casanova, L., & Marchetti, L. (2016, January). Assessing the efficacy of a diegetic game interface with Oculus Rift. In 2016 13th IEEE Annual Consumer Communications & Networking Conference (CCNC) (pp. 387-392). IEEE.

[12] Sauzéon, H., N'Kaoua, B., Arvind Pala, P., Taillade, M., & Guitton, P. (2016). Age and active navigation effects on episodic memory: a virtual reality study. British Journal of Psychology, 107(1), 72-94.

[13] Plancher, G., Gyselinck, V., Nicolas, S., & Piolino, P. (2010). Age effect on components of episodic memory and feature binding: A virtual reality study. Neuropsychology, 24(3), 379.

[14] Adams, H., Narasimham, G., Rieser, J., Creem-Regehr, S., Stefanucci, J., & Bodenheimer, B. (2018). Locomotive recalibration and prism adaptation of children and teens in immersive virtual environments. IEEE transactions on visualization and computer graphics, 24(4), 1408-1417.

[15] Narasimham, G., Adams, H., Rieser, J., & Bodenheimer, B. (2020). Encoding Height: Egocentric Spatial Memory of Adults and Teens in a Virtual Stairwell. In ACM Symposium on Applied Perception 2020 (pp. 1-8).

[16] Björling, E. A., Cicero, R., Sankar, A., & Sekar, A. (2019). Thought Disposal: Co-Designing a virtual interaction to reduce stress in teens. In Proceedings of the 18th ACM International Conference on Interaction Design and Children (pp. 562-567).

[17] Optale, G., Urgesi, C., Busato, V., Marin, S., Piron, L., Priftis, K., ... & Bordin, A. (2010). Controlling memory impairment in elderly adults using virtual reality memory training: a randomized controlled pilot study. Neurorehabilitation and neural repair, 24(4), 348-357.

[18] Hou, W. J., & Chen, X. L. (2021). Comparison of Eye-Based and Controller-Based Selection in Virtual Reality. International Journal of Human–Computer Interaction, 37(5), 484-495.

[19] Shum, L. C., Valdés, B. A., & Van der Loos, H. M. (2019). Determining the accuracy of oculus touch controllers for motor rehabilitation applications using quantifiable upper limb kinematics: Validation study. JMIR Biomedical Engineering, 4(1), e12291.

[20] Jost, T. A., Nelson, B., & Rylander, J. (2021). Quantitative analysis of the Oculus Rift S in controlled movement. Disability and Rehabilitation: Assistive Technology, 16(6), 632-636.

[21] Otte, K., Kayser, B., Mansow-Model, S., Verrel, J., Paul, F., Brandt, A. U., & Schmitz-Hübsch, T. (2016). Accuracy and reliability of the kinect version 2 for clinical measurement of motor function. PloS one, 11(11), e0166532.

[22] Borrego, A., Latorre, J., Alcañiz, M., & Llorens, R. (2018). Comparison of Oculus Rift and HTC Vive: feasibility for virtual reality-based exploration, navigation, exergaming, and rehabilitation. Games for health journal, 7(3), 151-156.

[23] Suznjevic, M., Mandurov, M., & Matijasevic, M. (2017, May). Performance and QoE assessment of HTC Vive and Oculus Rift for pick-and-place tasks in VR. In 2017 Ninth international conference on quality of multimedia experience (QoMEX) (pp. 1-3). IEEE.
[24] Fisher, R. A. (1992). Statistical methods for research workers. In Breakthroughs in statistics Springer, New York, NY. (pp.66-70).
[25] Williams, L. J., & Abdi, H. (2010). Fisher's least significant difference (LSD) test. Encyclopedia of research design, 218, 840-853.
[26] Allcoat, D., & von Mühlenen, A. (2018). Learning in virtual reality: Effects on performance, emotion and engagement. Research in Learning Technology, 26.
[27] Bhagat, K. K., Liou, W. K., & Chang, C. Y. (2016). A cost-effective interactive 3D virtual reality system applied to military live firing training. Virtual Reality, 20(2), 127-140.
[28] de Bruin, E. D., Schoene, D., Pichierri, G., & Smith, S. T. (2010). Use of virtual reality technique for the training of motor control in the elderly. Zeitschrift für Gerontologie and Geriatrie, 43(4), 229- 234.

MARIE: VALIDATION OF THE ARTIFICIAL INTELLIGENCE MODEL FOR COVID-19 DETECTION

Valdirene Bento[1], Bruno Frederico Salaroli[2] and Paula Santos[3,4]

[1]Radiologist responsible at UBS, Itapeva, Minas Gerais, Brazil
[2]General practitioner in Itapeva, Minas Gerais, Brazil
[3]Department of Psychology, University of São Paulo, Ribeirão Preto, Brazil
[4]Department of Head and Neck Surgery, Ophthalmology and Otorhinolaryngology, University of São Paulo, Ribeirão Preto, Brazil

ABSTRACT

Lung X-ray images, if processed using statistical and computational methods, can distinguish pneumonia from COVID-19. The present work shows that it is possible to extract lung X-ray characteristics to improve the methods of examining and diagnosing patients with suspected COVID-19, distinguishing them from malaria, tuberculosis, and Streptococcus pneumonia. More precisely, an intelligent computational model was developed to process lung X-ray images and classify whether the image is of a patient with COVID-19. In partnership with the municipality of Itapeva, Minas Gerais, we carried out patient analysis and, at the same time, we evolved the algorithms to meet the needs of health professionals and also expand support in tracking COVID-19 in the municipality. In this project we will describe cases and even signs and symptoms that were similar to the clinical performed by the doctor. The average recognition accuracy of COVID-19
was 0.97,4 ± 0.043.

KEYWORDS

Probabilistic Models, Machine Learning and Computer Vision and case studies

Full Text: **https://aircconline.com/ijma/V13N4/13421ijma02.pdf**

Volume Link: **https://airccse.org/journal/ijma_current21.html**

REFERENCES

[1] Santos, P. Intelligent Computational Model for the Classification of Covid-19 with Chest Radiography Compared to other Respiratory Diseases. Computer Science & Information Technology (CS & IT). 2021.
[2] Mattila JT, Fine MJ, Limper AH, Murray PR, Chen BB, Lin PL. Pneumonia. Treatment and Diagnosis. Ann Am Thorac Soc. 2014 Aug 11;4(5). doi: 10.1513/AnnalsATS.201401-027PL. Published Aug 12, 2014.
[3] Capone RB, Capone D, Mafort T, Mogami R, Rodrigues RS, Menna Barreto M, Rufino R. Aspects of Advanced Active Pulmonary Tuberculosis and Evaluation of Sequelae following Treatment. Pulm Med. 2017;2017:9876768. doi: 10.1155/2017/9876768. Published Feb 05, 2017.
[4] Rangari AP, Jayakumar M, Rodriguez MJ. Thoracic Computed Tomography Imaging in Dengue Fever: A Tertiary Experience in South Indian Population. International Journal of Contemporary Medical Research. 2018 5(6):F4-F6. doi: 10.21276/ijcmr.2018.5.6.5. Published Jun, 2018.
[5] Nicholas S. Hendren, Mark H. Drazner, Biykem Bozkurt, Leslie T. Cooper Jr. Description and Proposed Management of the Acute COVID-19 Cardiovascular Syndrome. Circulation, 2020.
[6] El-Kholy, Noha Ahmed. TI - Invasive Fungal Sinusitis in Post COVID-19 Patients: A New Clinical Entity - The Laryngoscope, 2021.
[7] Wang H, Xia Y. ChestNet: A Deep Neural Network for Classification of Thoracic Diseases on Chest Radiography. Cornell University. Published 9 Jul 2018
[8] Brian N, Naima, N.. HIGH FREQUENCY EMPHASIS FILTER INSTEAD OF HOMOMORPHIC FILTER. 10.1109/CSCI.2018.00099, 2019.
[9] He K, Gkioxari G, Dollar P, Girshick R. Mask R-CNN. IEEE Trans Pattern Anal Mach Intell. 2020 Feb;42(2):386-397. doi: 10.1109/TPAMI.2018.2844175. Published Jun 5, 2018.
[10] Löfstedt T, Brynolfsson P, Asklund T, Nyholm T, Garpebring A. Gray-level invariant Haralick texture features. PLoS One. 2019;14(2):e0212110. doi: 10.1371/journal.pone.0212110. PMID: 30794577. Published Feb 22, 2019.
[11] Pelleg D, Moore A. X-means: Extending k-means with efficient estimation of the number of clusters. In: Proc. Seventeenth Internat. Conf. on Machine Learning. Morgan Kaufmann. 2000; 727–734.Accessed May 10, 2020.
[12] Mantovani, RG, Horvath T, Cerri R & Barbon, S, Vanschoren J, de Carvalho A. An empirical study on hyperparameter tuning of decision trees. 2018. arXivpreprint arXiv:1812.02207. Published Feb 12, 2019. Accessed May 20, 2020.
[13] Pan F, Ye T, Sun P, Gui S, Liang B, Li L, Zheng D, Wang J, Hesketh RL, Yang L, Zheng C. Time Course of Lung Changes of Chest CT During Recovery From 2019 Novel Coronavirus(COVID-19) Pneumonia.Radiology2020. DOI: https://doi.org/10.1148/radiol.2020200370
[14] Rodrigues S, Rodrigues C, Vieira, Zangrando, Augusto, Fausto, T, Fausto, A. (2021). Avaliação de transformadas wavelets para fusão de imagens SPOT 4 e comparação de classificações de uma imagem fusionada e de uma imagem SPOT 5. 2021

AUTHOR

I obtained three bachelor's degrees in biomedical informatics and speech therapy from the University of Sao Paulo and mathematics from Anhembi Morumbi, a PhD in Sciences with a focus on Bioinformatics data in chronic pain and tinnitus models and a Post- doctorate in Psychology for the development of intelligent models for evaluation of social behaviors by the U. I also acted as Coordinator in projects of Bioinformatics and Artificial Intelligence in Medical Images in the evaluation of good or bad prognosis of childhood cancer by the Department of Pediatrics of the Hospital das Clínicas de Ribeirão Preto.