



DAFTAR PUSTAKA

- Abate, D., Ciavarella, R., Furini, G. Guarnieri, G., Migliori, S., dan Pierattini, S., *3D modeling and remote rendering technique of a high definition cultural heritage artefact*, Procedia Computer Science, Volume 3, 2011, pp. 848-852.
- Aderhold, A., Jung, Y., Wilkosinska, K. dan Fellner, D. W., 2013, *Distributed 3D model optimization for the web with the common implementation framework for online virtual museums*, Prosiding Digital Heritage International Congress (DigitalHeritage), Marseille, France.
- Adobe, 2018, *Adding multimedia to PDFs*, <https://helpx.adobe.com/acrobat/using/adding-multimedia-pdfs.html>
- Alharbi, N., Alharbi, M., Martinez, X., Krone, M., Rose, A., Baaden, M., Laramee, R. S., dan Chavent, M., 2017, *Molecular Visualization of Computational Biology Data: A Survey of Surveys*, Prosiding Eurographics Conference on Visualization (EuroVis 2017), Barcelona, Spain.
- Alizadehashrafi, B., 2017, *Framework for Iranian 3D SDI in CityGML*, Prosiding 8th International Summer School and Conference - Applied Geoinformatics for Society and Environment (AGSE 2017), Kish Island, Iran, pp. 18-25.
- Andrioti, H., Stamoulias, A., Kapetanakis, K., Panagiotakis, S., dan Malamos, A.G., 2015, *Integrating WebRTC and X3DOM: bridging the gap between communications and graphics*, Prosiding 20th International Conference on 3D Web Technology (Web3D '15), Heraklion, Crete, Greece, pp. 9-15.
- Anwar, B., 1999, *Bahasa Pemrograman VRML 1.0*, PT Elex Media Komputindo.
- Appleton, B., 2008, *Patterns and Software: Essential Concepts and Terminology*, Blackboard Academic Suite, <http://csis.pace.edu/~grossman/dcs/Patterns%20and%20Software-%20Essential%20Concepts%20and%20Terminology.pdf>
- Arrendash, D., 2004, *The unreal editor as a Web 3D authoring environment*, Prosiding Ninth International Conference on 3D Web Technology, Monterey, California, USA, pp. 119-126.
- Attia, S., Beltrán, L., Herde, A. D., dan Hensen, J., 2009, “Architect Friendly”: A Comparison of Ten Different Building Performance Simulation Tools, Prosiding Eleventh International IBPSA Conference, Glasgow, Scotland, pp. 204-211.
- Badea, G., 2014, *Importance of 3D Modeling Software in Urban Environment*, International Journal of Systems Applications, Engineering & Development, Volume 8, pp. 100-107.
- Bajcsy, P., Kooper, R., Marini, L., McHenry, K., dan Ondrejcek, M., 2010, *A framework for understanding file format conversions*, Prosiding 2010 Roadmap



for Digital Preservation Interoperability Framework Workshop (US-DPIF '10), Gaithersburg, Maryland, USA, Article 10.

- Banerjee, P. dan Zetu, D., 2001, *Virtual Manufacturing*, John Wiley & Sons, Inc.
- Barbadillo, J., dan Sánchez, J. R., 2013, *A Web3D authoring tool for augmented reality mobile applications*, Prosiding 18th International Conference on 3D Web Technology (Web3D '13), San Sebastian, Spain, pp. 206-206.
- Basci, D. dan Misra, S., 2007, *Complexity Metric for XML Schema Documents*, Prosiding 5th International Workshop on SOA and Web Practices, pp. 1-14.
- Beard, D., 2006, *Using VRML to Share Large Volumes of Complex 3D Geoscientific Information via the Web*, Prosiding Eleventh International Conference on 3D Web Technology, Association for Computing Machinery, New York, USA, pp. 163-167.
- Behr, J., Eschler, P., Jung, Y. dan Zöllner, M., 2009, *X3DOM: a DOM-based HTML5/X3D integration model*, Prosiding 14th International Conference on 3D Web Technology (Web3D '09), Darmstadt, Germany, Juni 2009, pp. 127-135.
- Behr, J., Jung, Y., Keil, J., Drevensek, T., Zöllner, M., Eschler, P., dan Fellner, D., 2010, *A scalable architecture for the HTML5/X3D integration model X3DOM*, Prosiding 15th International Conference on Web 3D Technology (Web3D '10), Los Angeles, California, pp. 185-194.
- Behr, J., Jung, Y., Drevensek, T., dan Aderhold, A., 2011, *Dynamic and interactive aspects of X3DOM*, Prosiding 16th International Conference on 3D Web Technology (Web3D '11), Paris, France, pp. 81-87.
- Berthelot, R. B., Royan, J., Duval, T. dan Arnaldi, B., 2011, *Scene graph adapter: an efficient architecture to improve interoperability between 3D formats and 3D applications engines*, Prosiding 16th International Conference on 3D Web Technology, Anaheim, California, pp. 21-29.
- Berthelot, R. B., Royan, J., Duval, T. dan Arnaldi, B., 2012, *3DFC: a new Container model for 3D File formats compositing*, Prosiding 17th International Conference on 3D Web Technology, Los Angeles, California, pp. 27-35.
- Bitmanagement.com, 2017, BS SDK, <http://www.bitmanagement.com/en/products/authoring-tools/bs-sdk>
- Blais, C., Brutzman, D., Horner, D. dan Nicklaus, S., 2001, *Web-based 3D Technology for Scenario Authoring and Visualisation: the SAVAGE Project*, Prosiding Interservice/Industry Training, Simulation, and Education Conference (I/ITSEC) 2001, National Training and Simulation Association (NTSA), Orlando, Florida, USA.
- blender.org, 2019, *Blender, made by you*, <https://www.blender.org>
- Bobylev, D., 2017, *Comparison of 3D Modelling software*, Tesis, Faculty of Technology, Lappeenranta, Saimaa University of Applied Sciences.



- Boutsi, A., Ioannidis, C., dan Soile, S., 2019, *Interactive Online Visualization of Complex 3D Geometries*, The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, Volume XLII-2/W9.
- Brutzman, D. dan Daly, L., 2007a, *X3D: Extensible 3D Graphics for Web Authors*, Morgan Kaufmann Publishers.
- Brutzman, D. dan Daly, L., 2007b, *X3D: Extensible 3D Graphics Standard [Standards in a Nutshell]*, IEEE Signal Processing Magazine, Volume 24 Number 6 November 2007, pp. 130-135, IEEE.
- Burns, M., 2011, *Plug-in free 3D graphics for HTML5 Web browsers*, IDG Consumer & SMB, San Francisco, CA, USA, <http://www.macworld.com/article/1158363/webgl.html>.
- Callieri, M., Leoni, C., Dellepiane, M. dan Scopigno, R., 2013, *Artworks narrating a story: a modular framework for the integrated presentation of three-dimensional and textual contents*, Prosiding 18th International Conference on 3D Web Technology, San Sebastian, Spain, pp. 167-175.
- Calori, L., Camporesi, C. dan Pescarin, S., 2009, *Virtual Rome: a FOSS approach to WEB3D*, Prosiding 14th International Conference on 3D Web Technology, Darmstadt, Germany, pp. 177-180.
- Cao, H., Hou, X. dan Feng, Y., 2018, *WebGL-Based Research on Virtual Visualization Simulation Display Platform of Ship*, Prosiding 2nd IEEE Advanced Information Management, Communicates, Electronic and Automation Control Conference (IMCEC 2018), Xi'an, China, pp. 895-899.
- Carey, R., Bell, G. dan Marrin C., 1997, *ISO/IEC 14772-1:1997 Virtual Reality Modeling Language (VRML97)*, The VRML Consortium Incorporated, <http://www.vrml.org/Specifications/VRML97>.
- Cauldwell, P., 2008, *Code Leader: Using People, Tools, and Processes to Build Successful Software*, Wiley Publishing Inc., Indianapolis, IN, USA.
- Cerbo, F. D., Dodero, G. dan Papaleo, L., 2010, *Integrating a Web3D interface into an e-learning platform*, Prosiding 15th International Conference on Web 3D Technology (Web3D '10), Los Angeles, California, USA, pp. 83-92.
- Chakravorty, D., 2019, *8 Most Common 3D File Formats in 2019*, All3DP, <https://all3dp.com/3d-file-format-3d-files-3d-printer-3d-cad-vrml-stl-obj/>
- Chen, B. dan Nishita, T., 2001, *jGL and its Applications as a Web3D Platform*, Prosiding Sixth International Conference on 3D Web Technology (Web3D '2001), 85-91.
- Chiavarini, B., De Luca, D., Guidazzoli, A., Liguori, M. C., Imboden, S., dan Verri, L., 2019, *Optimising 3D cultural environments with large amount of texts for 3D Web. The Santo Stefano Lapidarium to the dead soldiers of the Great War, a case study*, Prosiding Electronic Imaging & the Visual Arts (EVA 2019), Florence, Italia, pp. 158-165.



- Chittaro, L. dan Ranon, R., 2007, *Web3D technologies in learning, education and training: Motivations, issues, opportunities*, Computers & Education, Volume 49 Issue 1, August, 2007, 3-18, Elsevier Science Ltd. Oxford, UK.
- Chittaro, L. dan Serra M., 2004, *A Brief Introduction to Web3D Technologies in Education: Motivations, Issues, Opportunities*, Prosiding First International Workshop on Web3D Technologies in Learning, Education, and Training (LET-WEB3D 2004), University of Udine (Italy).
- Chourio, X., Luengo, F. dan Pirela, G., 2011, *Creating Multiuser Web3D Applications Embedded in Web Pages*, International Journal of Computer Science Issues (IJCSI), Vol. 8, Issue 1, January 2011.
- Cortona3D, 2018, *RapidAuthor*, <http://cortona3d.com/rapidauthor>
- Costa, C. P., Rodrigues, J. I. J. dan Figueiredo, M. J. G, 2011, *A Web3DGIS Framework using CityGML and X3D*, Prosiding Ibero-American Symposium in Computer Graphics (SIACG 2011), Faro, Portugal, pp. 113-116.
- Curtis, N., 2010, *Modular Web Design: Creating Reusable Components for User Experience Design and Documentation*, Berkeley, CA: New Riders.
- de Byl, P., 2009, *Making Web3D less scary: Toward Easy-to-Use Web3D e-Learning Content Development Tools for Educators*, Innovate: Journal of Online Education, Vol. 5 Issue 5 (June/July 2009), Fischler School of Education and Human Services, Nova Southeastern University (Florida, USA).
- Desprat, C., Jessel, J. P. dan Luga, H., 2015, *A 3D collaborative editor using WebGL and WebRTC*, Prosiding 20th International Conference on 3D Web Technology, Heraklion, Crete, Greece, pp. 157-158.
- Desprat, C., Jessel, J. P. dan Luga, H., 2016, *3DEvent: a framework using event-sourcing approach for 3D web-based collaborative design in P2P*, Prosiding 21st International Conference on Web3D Technology (Web3D '16), Anaheim, California, USA, pp. 73-76.
- Doboš, J., Fan, C., Knapo, P., dan Wong, C., 2018, *Applications of web3D technology in architecture, engineering and construction*, Prosiding 23rd International ACM Conference on 3D Web Technology (Web3D '18), Poznań, Poland, Article no. 30, 2 pages.
- Earl, C. dan Neal, E., 2016, *HTML5 accessible video player: how and why*, Prosiding 13th Web for All Conference 2016 (W4A '16), Montreal, Canada.
- ECMA International, 2007, *Standard ECMA-363 Universal 3D File Format*, <https://www.ecma-international.org/publications/standards/Ecma-363.htm>
- Englert, M., Klomann, M., dan Jung, Y., 2017, *Optimized streaming of large web 3D applications*, Prosiding 23rd International Conference on Virtual System & Multimedia (VSMM), Dublin, pp. 1-8.
- EunHee K., Jinsang H., Gyeong-June H., dan Hyun, L. J., 2015, *3D CAD model visualization on a website using the X3D standard*, Computers in Industry, Volume 70, Juni 2015, pp. 116-126.



- Evans, A., Romeo, M., Bahrehamd, A., Agenjo, J., dan Blat, J., 2014, *3D graphics on the web: A survey*, Computers & Graphics, Volume 41 2014, pp. 43-61.
- Farrell-Vinay, P., 2008, *Manage Software Testing*, Auerbach Publications, Boca Raton, FL, USA.
- Ferilli, S., Esposito, F. dan Redavid, D., 2013, *Hi-Fi HTML rendering of multi-format documents in DoMinUS*, Prosiding 2013 ACM symposium on Document engineering 2013 (DocEng '13), Florence, Italy, pp. 173-176.
- Fernandes, A.R., 2018, *VRML Interactive Tutorial – Inline Node*, Lighthouse3D, <http://www.lighthouse3d.com/vrml/tutorial/index.shtml?inline>
- Ferreira, N.B.T., 2012, *A WebGL application based on BIM IFC*, Tesis, Universidade Fernando Pessoa - Porto.
- Flotyński, J. dan Walczak, K., 2014, *Semantic representation of multi-platform 3D content*, Computer Science and Information Systems 2014 Volume 11, Issue 4, Pages: 1555-1580, ComSIS Consortium (Novi Sad, Serbia).
- Fraunhofer-Gesellschaft, 2018, *X3DOM at A Glance*, <https://www.x3dom.org/>
- Fulton, S. Dan Fulton, J., 2013, *HTML5 Canvas - Second Edition*, O'Reilly Media Inc.
- Gaidytė, R., 2010, *2D and 3D Modeling Comparison, Project Report of Geodesy and Cartography Department at Lithuania Vilnius Gediminas Technical University, Geomatics Department, Gjøvik University College, Norway*.
- Gaillard, J., Vienne, A., Baume, R., Pedrinis, F., Peytavie, A., dan Gesquière, G., 2015, *Urban data visualisation in a web browser*, Prosiding 20th International Conference on 3D Web Technology (Web3D '15), Heraklion, Crete, Greece, pp. 81-88.
- Galli, R. dan Luo, Y., 2000, *Mu3D: a causal consistency protocol for a collaborative VRML editor*, Prosiding Fifth symposium on Virtual reality modeling language (Web3D-VRML), Monterey, California, USA, pp. 53-62.
- Gatto, I. dan Pittarello, F., 2014, *Creating Web3D educational stories from crowdsourced annotations*, Journal of Visual Languages & Computing, Volume 25, Issue 6, pp. 808-817.
- Gelautz, M., Brandejski, M., Kilzer, F., dan Amelung, F., 2004, *Web-based visualization and animation of geospatial data using X3D*, Prosiding IEEE International Geoscience and Remote Sensing Symposium (IGARSS '04) Volume 7, Anchorage Alaska, pp. 4773-4775.
- Geroimenko, V. dan Chen, C., 2005, *Visualizing Information Using SVG and X3D: XML-based Technologies for the XML-based Web*, London: Springer-Verlag London Limited.
- Glunz, B.F., Pearson, W. R., dan Munoz, A.F., 2017, *Method and system for creating 3D models from 2D data for building information modeling (BIM)*, US Patent no. 9,817,922 B2, Nov 14, 2017, Anguleris Technologies LLC, Elgin, IL, USA.



- Gregory, J., 2009, *Game Engine Architecture Second Edition*, Boca Raton, FL: CRC Press.
- Heidrich, W. dan Seidel, H.P., 1999, *Realistic, hardware-accelerated shading and lighting*, Prosiding 26th annual conference on Computer graphics and interactive techniques (SIGGRAPH '99), ACM Press/Addison-Wesley Publishing Co., New York, NY, USA, pp. 171-178.
- Heilmann, C., 2006, *Beginning JavaScript with DOM Scripting and Ajax: From Novice to Professional*, Apress.
- Holmberg, N., Wünsche B. dan Tempero, E., 2006, *A Framework for Interactive Web-Based Visualization*, Prosiding 7th Australasian User Interface Conference (AUIC '06), Hobart, Australia, Volume 50, pp. 137-144.
- Holzner, S., 2009, *Ajax: A Beginner's Guide*, The McGraw-Hill Companies.
- Hopkins, G., 2011, *The Joy of Java 3D*, Java3D.org, <http://www.java3d.org/introduction.html>.
- Hu, Y., Chen, Z., Liu, X., Huang, F., dan Jia, J., 2017, *WebTorrent based fine-grained P2P transmission of large-scale WebVR indoor scenes*, Prosiding 22nd International Conference on 3D Web Technology (Web3D '17), Brisbane, Queensland, Australia, Article 7, 8 pages.
- Huang C., Zhou, W., Lan, Y., Chen, F., Hao, Y., Cheng, Y., dan Peng, Y., 2019, *A Novel WebVR-Based Lightweight Framework for Virtual Visualization of Blood Vasculum*, IEEE Access, volume 6, pp. 27726-27735.
- Hudson, N., Alcock, C., dan Chilana, P.K., 2016, *Understanding Newcomers to 3D Printing: Motivations, Workflows, and Barriers of Casual Makers*, Prosiding 2016 CHI Conference on Human Factors in Computing Systems (CHI '16), San Jose, California, USA, pp. 384-396.
- Ieronutti, L. dan Chittaro, L., 2005, *A Virtual Human Architecture that Integrates Kinematic, Physical, and Behavioral Aspects to Control H-Anim Characters*, Prosiding 10th International Conference on 3D Web Technology, ACM Inc.
- Ieronutti, L. dan Chittaro, L., 2007, *Employing Virtual Humans for Education and Training in X3D/VRML Worlds*, Computers & Education, Volume 49 Issue 1, pp. 93-109, Elsevier Science Inc.
- IGIG, 2019a, *What is Web3D*, IGI Global, <https://www.igi-global.com/dictionary/design-of-a-web3d-serious-game-for-human-anatomy-education/48855>.
- IGIG, 2019b, *What is Software Framework*, IGI Global, <https://www.igi-global.com/dictionary/software-framework/27680>.
- Iglesias, D.G., 2012, *Design And Implementation of 3D Buildings Integration For A WebGL-Based Virtual Globe*, Tesis, Universidade Nova.
- Isdale, J., 1998, *What is Virtual Reality?*, <http://vr.isdale.com/WhatIsVR/noframes/WhatIsVR4.1-Types.html>.



- Jeschke, S., Wimmer, M., dan Purgathofer W., 2005, *Image-based Representations for Accelerated Rendering of Complex Scenes*, STAR (State of the Art Report) in the 26th annual conference of the European Association for Computer Graphics (EUROGRAPHICS 2005), Trinity College Dublin, Ireland.
- Jankowski, J. dan Decker, S., 2012, *A dual-mode user interface for accessing 3D content on the world wide web*, Prosiding 21st international conference on World Wide Web (WWW '12), Lyon, France, pp. 1047-1056.
- John, N.W., 2007, *The Impact of Web3D Technologies on Medical Education and Training*, Computers & Education, Volume 49 Issue 1, 19-31, Elsevier Science Inc.
- Jung, Y., Keil, J., dan Behr, J., 2012, *Declarative (X)3D in HTML5*, Prosiding 1st International Workshop on Declarative 3D for the Web Architecture (Dec3D2012 at WWW2012), Lyon, France.
- Junk, S., Kuen, C., 2016, *Review of Open Source and Freeware CAD Systems for Use with 3D-Printing*, Procedia CIRP, Volume 50, pp. 430-435.
- Kappel, G., Proll, B., Reich, S. dan Retschitzegger, W., 2006, *Web Engineering*, John Wiley & Sons Ltd.
- Konkle, T., dan Oliva, A., 2011, *Canonical visual size for real-world objects*, Journal of Experimental Psychology: Human Perception and Performance, Vol 37 no. 1, pp. 23-37.
- Kováč, M., 2006, *Distributed Collaborative Environment Based on Web3D*, Prosiding CESCG-2006.
- Krispel, U., Settgast, V., dan Fellner, D. W., 2018, *Dynamo - dynamic 3D models for the web: a declarative approach to dynamic and interactive 3D models on the web using x3dom*, Prosiding 23rd International ACM Conference on 3D Web Technology (Web3D '18), Poznań, Poland, Article 16, 5 pages.
- Kurniadi, A., 1999, *Membuat Sendiri Dunia VRML*, PT Elex Media Komputindo.
- Lavoué, G., Chevalier, L., Caillaud, F., dan Dupont, F., 2016, *Progressive streaming of textured 3D models in a web browser*, Prosiding 20th ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games (I3D '16), Redmond, Washington, pp. 203-203.
- Leenheer, N., 2016, *HTML5 Test – version 8.0*, <https://html5test.com/index.html>
- Lemay, L., Couch, J. dan Murdock, K., 1996, *Laura Lemay's Web Workshop: 3D Graphics & VRML 2.0*, Sams Publishing.
- Lewis, M., 2003, *Bowen Virtual Theater*, Prosiding ACM SIGGRAPH 2003 Web Graphics, San Diego, California.
- Lewis, W. E., 2005, *Software Testing and Continuous Quality Improvement 2nd ed.*, Auerbach Publications, Boca Raton, FL, USA.
- Lian, Y., He, L., Ping, J., Zhang, H., Zeng, X., Wang, C., dan Chen, L., 2017, *Research and Implementation on the Web3D Visualization of Digital Moon Based on*



- WebGL*, Prosiding 2017 IEEE International Geoscience and Remote Sensing Symposium (IGARSS 2017), Fort Worth, Texas, USA, pp. 6094-6097.
- Limberger, D., Pursche, M., Klimke, J., dan Döllner, J., 2017, *Progressive high-quality rendering for interactive information cartography using WebGL*, Prosiding 22nd International Conference on 3D Web Technology (Web3D '17), Brisbane, Queensland, Australia, Article no. 8, 4 pages.
- Lin, Q., Neo, H. K., Zhang, L., Huang, G. dan Gay, R., 2007, *Grid-based large-scale Web3D collaborative virtual environment*, Prosiding 12th International Conference on 3D Web Technology (Web3D '07), Perugia, Italy, pp. 123-132.
- Liu, X., Xie, N., dan Jia, J., 2015, *Web3D-based Online Walkthrough of Large-scale Underground Scenes*, IEEE/ACM 19th International Symposium on Distributed Simulation and Real Time Applications (DS-RT 2015), Chengdu, Sichuan, China, pp. 104-107.
- Lu, Z., Guerrero, P., Mitra, N. J., dan Steed, A., 2016, *Open3D: crowd-sourced distributed curation of city models*, Prosiding 21st International Conference on Web3D Technology (Web3D '16), Anaheim, California, USA, pp. 87-94.
- Luan, X. D., Xie, Y. X., Ying, L. dan Wu, L. D., 2008, *Research and Development of 3D Modeling*, International Journal of Computer Science and Network Security, Vol. 8 No. 1, pp. 49-53.
- Luo, L. dan Tan, X., 2017, *Research of Model Scheduling Strategy in Large Web3D Scene Based on XML*, Prosiding 9th International Conference on Electronics, Computers and Artificial Intelligence (ECAI 2017), Targoviste, România, pp. 1-4.
- Luo, L. dan Yang, X., 2019, *A 3D Scene Management Method Based on the Triangular Mesh for Large-Scale Web3D Scenes*, IEEE MultiMedia, Early Access 2019, pp 1-1.
- Macedonia, M., 2013, *3D for the Web*, IEEE Computer Graphics and Applications, Volume 33, Issue 5, Sept.-Oct. 2013, pp 24-25.
- Marcincin, J. N., 2007, *Application Of The Virtual Reality Modelling Language In Automated Technological Workplaces Design*, Engineering Review, Vol. 27 No. 1, Desember 2007, pp. 1-6.
- Marion, C. dan Jomier, J., 2012, *Real-time Collaborative Scientific WebGL Visualization with WebSocket*, Prosiding 17th International Conference on 3D Web Technology (Web3D '12), Los Angeles, California, USA, pp. 47-50.
- Masoodian, M., Yusof, A. b. M., Rogers, B., 2015, *Supporting Focus and Context Awareness in 3D Modelling Tasks Using Multi-Layered Displays*, Computer Graphics forum, Volume 34, Issue 6, Sept 2015. pp. 1–12.
- McCabe, T. J., 1976, *A Complexity Measure*, IEEE Transactions on Software Engineering, Vol. SE-2, No. 4.



- McHenry, K., dan Bajcsy, P., 2008, *An Overview of 3D Data Content, File Formats and Viewers*, Technical Report isda08-002, Image Spatial Data Analysis Group, National Center for Supercomputing Applications, Urbana-Champaign, IL.
- McHenry, K., Ondrejcek, M., Marini, L., Kooper, R., dan Bajcsy, P., 2011, *Towards a Universal Viewer for Digital Content*, Procedia Computer Science, Volume 4 2011, pp. 732-739.
- Miao, R., Song, J., dan Zhu, Y., 2017, *3D geographic scenes visualization based on WebGL*, Prosiding 6th International Conference on Agro-Geoinformatics, Fairfax, VA, pp. 1-6.
- Mindek, P., Kouřil, D., Sorger, J., Toloudis, D., Lyons, B., Johnson, G., Gröller, M. E., dan Viola, I., 2018, *Visualization Multi-Pipeline for Communicating Biology*, IEEE Transactions on Visualization and Computer Graphics, Volume 24, No. 1, January 2018, pp. 883-892.
- Ming, L. W. dan Gibson, I., 2002, *Specification of VRML in Color Rapid Prototyping*, International Journal of CAD/CAM, Volume 1, No. 1, pp. 1-9.
- Monteiro, E. J. M., Costa, C. dan Oliveira, J. L., 2013, *A DICOM viewer based on web technology*, Prosiding IEEE 15th International Conference on e-Health Networking, Applications and Services (Healthcom 2013), Lisbon, pp. 167-171.
- Mukai, A., Yamagishi, Y., Hirayama, M.J., Tsuruoka, T., dan Yamamoto, T., 2011, *Effects of Stereoscopic 3D Contents on the Process of Learning to Build a Handmade PC*, Knowledge Management & E-Learning: An International Journal, Volume 3, No.3 (2011), pp. 491-506.
- Nazarov, R. dan Galletly, J., 2013, *Native browser support for 3D rendering and physics using WebGL, HTML5 and Javascript*, Prosiding Sixth Balkan Conference in Informatics 2013 (BCI-LOCAL 2013), Thessaloniki, Greece.
- Nghiem, T.P., Carlier, A., Morin, G. dan Charvillat, V., 2013, *Towards 3D Crowdsourcing: Easing Web3D Navigation Using User Traces*, Prosiding European Concurrent Engineering Conference (ECEC 2013), University of Lincoln, Lincoln, UK, pp. 34-40.
- Nishida, G., Garcia-Dorado, I., Aliaga, D.G., Benes, B., dan Bousseau, A., 2016, *Interactive Sketching of Urban Procedural Models*, ACM Transactions on Graphics, Volume 35 Issue 4, Article no. 130, July 2016, 11 pages.
- Oliveira, N. dan Rocha, J.G., 2013, *Web 3D Service Implementation*, Prosiding 13th International Conference of Computational Science and Its Applications (ICCSA 2013), Ho Chi Minh City, Vietnam, pp. 538-549.
- Ortiz, S., 2010, *Is 3D Finally Ready for the Web?*, IEEE Computer, Vol. 43 No. 1, Jan. 2010, pp. 14-16.
- Ostrowski, D.A., 2007, *A Web-Based 3D Gaming Style Multi-user Simulation Architecture*, Web3D Games 2007 1st International Workshop, <http://www.web3d.org/x3d/learn/presentations/Web3DGames2007Workshop.pdf>.



- Parker, S. P., 2002, *McGraw-Hill Dictionary of Scientific and Technical Terms 6th Edition*, The McGraw-Hill Companies Inc., New York, USA.
- Parsons, J.J. dan Oja, D., 2014, *New Perspectives on Computer Concepts 2014: Introductory*, Cengage Learning, Boston, MA, USA.
- Pasman, W. dan Jansen, F. W., 2002, *Scheduling level of detail with guaranteed quality and cost*, Prosiding 7th International Conference on 3D Web Technology, Tempe, Arizona, USA, pp. 43-51.
- Paul, R., 2009, *Google joins effort for 3D Web standard with new plugin, API*, Conde Nast, California, USA, <http://arstechnica.com/information-technology/2009/04/google-releases-3d-graphics-plugin-for-browsers/>.
- Pereira, K.J., 2013, *Water Simulation on WebGL and Three.js*, Tesis, Department of Computer Science, Honors College of The University of Southern Mississippi, Hattiesburg, MS.
- Pesce, M., 1995, *VRML: Browsing & Building Cyberspace*, New Riders Publishing.
- Pinto, E. M., 2009, *A Graphics Pipeline for Directly Rendering 3D Scenes on Web Browsers*, Disertasi, Computer Graphics and Multimedia Group, Department of Computer Science, University of Beira Interior, Covilha, Portugal.
- Pittarello, F., 2013, *Testing the X3DOM framework for the development of Web3D applications*, Prosiding 18th International Conference on 3D Web Technology (Web3D '13), San Sebastian, Spain, pp. 191-194.
- Poirson, E. dan Delangle, M., 2013, *Comparative analysis of human modeling tools*, Prosiding The 2nd International Digital Human Modeling Symposium (DHM2013), Ann Arbor, USA.
- Poisel, R., Tjoa, S., dan Tavolato, P., 2011, *Advanced file carving approaches for multimedia files*, Journal of Wireless Mobile Networks, Ubiquitous Computing, and Dependable Applications (JoWUA), volume 2 number 4, pp. 42-58.
- Pomaska, G., 2003, *Implementation of Web 3d Tools for Creating Interactive Walkthrough Environments from Building Documentations*, The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences (ISPRS), Vol. XXXIV, Part 5/W12, (ISPRS WG V/4 and IC WG III International Workshop on Vision Techniques for Digital Architectural and Archaeological Archives), Portonovo-Acona, Italy, pp. 268-272.
- PORT, 2019, *File Formats and Conversion*, Postgraduate Online Research Training, School of Advanced Study – University of London, <https://port.sas.ac.uk/mod/book/view.php?id=1309&chapterid=923>
- Potenziani, M. Callieri, M. dan Scopigno, R., 2018, *Developing and Maintaining a Web 3D Viewer for the CH Community: an Evaluation of the 3DHOP Framework*, Prosiding The 16th EUROGRAPHICS Workshop on Graphics and Cultural Heritage (EG GCH 2018), Vienna, Austria, pp. 169-178.
- Pressman, R. S., 2001, *Software Engineering: A Practitioner's Guide, 5e*, McGraw-Hill Higher Education.



- Pressman, R. S. dan Maxim, B., 2014, *Software Engineering: A Practitioner's Guide, 8e*, McGraw-Hill Higher Education.
- Rančić, D. dan Dačić D., 2004, *Ginis Web 3D Modeler – A Framework for 3D Terrain Visualization on Web*, Prosiding 8th AGILE International Conference on Geographic Information Science (AGILE 2005), Estoril, Portugal, 26-28 Mei 2005, pp. 383-391.
- Rasys, E., Hodds, M., Dawood, N. dan Kassem, M., 2014, *A Web3D Enabled Information Integration Framework for Facility Management*, Prosiding 13th International Conference on Construction Applications of Virtual Reality, London, UK, pp. 1-12.
- Riehle, D., 2000, *Framework Design: A Role Modeling Approach*, Ph.D. Thesis, No. 13509, Swiss Federal Institute of Technology Zürich, Switzerland, ETH Zürich.
- Rose, A. S., Bradley, A. R., Valasatava, Y., Duarte, J. M., Prlić, A., dan Rose, P. W., 2016, *Web-based molecular graphics for large complexes*, Prosiding 21st International Conference on Web3D Technology (Web3D '16), Anaheim, California, USA, pp. 185-186.
- Rosener, B., 2014, *3D Modeling Programs: Comparison of SketchUp and Blender*, Prosiding The 12th International Conference on Education and Information Systems, Technologies and Applications (EISTA 2014), Orlando, Florida, USA.
- Rossignac, J., 2005, *Shape Complexity*, The Visual Computer - International Journal of Computer Graphics, Volume 21, Issue 12, December 2005, pp. 985-996.
- Rouse, M., 2005, *Operating Systems - File Format*, TechTarget Network, <https://whatis.techtarget.com/definition/file-format>
- Sawicki, B. dan Chaber, B., 2013, *Efficient visualization of 3D models by web browser*, Computing Volume 95 (Supplement 1), pp. 661-673.
- Schilling, A., Bolling, J., dan Nagel, C., 2016, *Using glTF for streaming CityGML 3D city models*, Prosiding 21st International Conference on Web3D Technology (Web3D '16), Anaheim, California, USA, pp. 109-116.
- Schmitt, G., 1989, *Classes of Design-Classes of Tools*, Prosiding The Electronic Design Studio - Architectural Knowledge and Media in the Computer Era, CAAD futures, Boston, USA, pp. 77-90.
- Schneider, K.D. dan Michielot, S.M., 1998, *VRML Primer & Tutorial*, TECFA - Faculte de Psychologie et des sciences de l'education, University of Geneva, <http://tecfa.unige.ch/guides/vrml/vrmlman/vrmlman.pdf>.
- Schöning J. dan Heidemann, G., 2015, *Evaluation of Multi-view 3D Reconstruction Software*, Prosiding Computer Analysis of Images and Patterns (CAIP 2015), Valletta, Malta, pp. 450-461.
- Schöning, J., Faion, P., Heidemann, G., dan Krumnack, U., 2017, *Providing Video Annotations in Multimedia Containers for Visualization and Research*, Prosiding 2017 IEEE Winter Conference on Applications of Computer Vision (WACV), Santa Rosa, CA, pp. 650-659.



- Schubotz, R. dan Harth, A., 2012, *Towards Networked Linked Data-Driven Web3D Applications*, Prosiding 1st International Workshop on Declarative 3D for the Web Architecture (Dec3D2012 at WWW2012), Lyon, France.
- Scopigno, R., Callieri, M., Dellepiane, M., Ponchio, F., dan Potenziani, M., 2017, *Delivering and using 3D models on the web: are we ready?*, Virtual Archaeology Review, Vol 8, No 17, July 2017, pp. 1-9.
- Scully, T., Doboš, J., Sturm, T., dan Jung, Y., 2015, *3drepo.io: building the next generation Web3D repository with AngularJS and X3DOM*, Prosiding 20th International Conference on 3D Web Technology (Web3D '15), Heraklion, Crete, Greece, pp. 235-243.
- Shah, M. H. dan Mahmood, Z., 2006, *Frameworks for Building Enterprise Information Architectures*, Prosiding 2006 Information Resources Management Association International Conference, Washington, USA, pp. 541-544.
- Shankland, S., 2010, *Google scraps plug-in, refashions 3D Web plan*, CBS Interactive Inc, San Francisco, CA, USA, http://news.cnet.com/8301-30685_3-20004490-264.html.
- Shirley, P., Ashikhmin, M., Gleicher, M., Marschner, S.R., Reinhard, E., Sung, K., Thompson, W.B., and Willemse, P., 2005, *Fundamentals of Computer Graphics*, Wellesley, Massachusetts: A K Peters.
- Shneiderman, B., 2003, *Why Not Make Interfaces Better Than 3D Reality?*, IEEE Computer Graphics and Applications, November/December 2003, IEEE Computer Society.
- Silva, D. A. M. S. dan Tal, D., 2014, *Google Sketchup: 3D Environmental Modeling Tool For Sustainable Landscape Designing*, Prosiding SAITM Research Symposium on Engineering Advancements 2014 (SAITM – RSEA 2014), Malabe, Sri Lanka.
- Sinclair, P.A.S., 2004, *Integrating Hypermedia Techniques with Augmented Reality Techniques*, Disertasi, Faculty of Engineering and Applied Science, Department of Electronics and Computer Science, University of Southampton, UK.
- Singh, S. P., Jain, K., dan Mandla, V. R., 2014, *Image Based 3D City Modeling: Comparative Study*, The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, Volume XL-5, 2014, ISPRS Technical Commission V Symposium, Riva del Garda, Italy, pp. 537-546.
- Soares, L. P., dan Zuffo, M. K., 2004, *JINX: an X3D browser for VR immersive simulation based on clusters of commodity computers*, Prosiding Ninth International Conference on 3D Web Technology, Monterey, California, pp. 79-86.
- Sons, K., Klein, F., Rubinstein, D., Byelozorov, S., dan Slusallek, P., 2010, *XML3D: interactive 3D graphics for the web*, Prosiding 15th International Conference on Web 3D Technology (Web3D '10), Los Angeles, California, pp. 175-184.



- Sopin, I., 2010, *Extending the Web3D: Design of Conventional GUI Libraries in X3D*, Tesis, Faculty of the School of Graduate Studies at Armstrong Atlantic State University.
- Spini, F., Marino, E., D'Antimi, M., Carra, E., dan Paoluzzi, A., 2016, *Web 3D indoor authoring and VR exploration via texture baking service*, Prosiding 21st International Conference on Web3D Technology (Web3D '16), Anaheim, California, USA, pp. 151-154.
- Steiakaki, M., Kontakis, K. dan Malamos, A. G., 2016, *Real-Time Collaborative Environment for Interior Design based on Semantics, Web3D and WebRTC*, Prosiding 15th International Symposium on Ambient Intelligence and Embedded Systems (AmiEs), Heraklion, Greece.
- Stepan, V., 2003, *Using VRML EAI in Applets and Applications*, Prague, Czech http://mira.svalbard.cz/pubs/Using_VRML_EAI_v2.pdf
- Sutanto, A., Ihsan, M., dan Mulyadi, I. H., 2018, *Extending Interactive Electronic Maintenance Manual with Web3D Technologies*, International Journal on Advanced Science, Engineering and Information Technology, Volume 8, No 4 (2018) pp. 1185-1190.
- Szostek, K., Piorkowski, A., 2010, *OpenGL in Multi-User Web-Based Applications, Innovations in Computing Sciences and Software Engineering*, Springer, pp. 379-383.
- Takahashi, D., 2011, *Browser makers release standard to bring 3D graphics to web apps without plug-ins*, VentureBeat, San Francisco, CA, USA, <http://venturebeat.com/2011/03/03/browser-makers-release-standard-to-bring-3d-graphics-to-web-apps-without-plug-ins/>
- Talend, 2019, *Beginner's Guide to Batch Processing*, Talend Inc., <https://www.talend.com/resources/batch-processing/>
- TFD, 2003, *Data Conversion*, The Free Dictionary, The Computer Language Company Inc., <https://encyclopedia2.thefreedictionary.com/File+conversion>
- Thorne, C., 2005, *Exploiting an Evolutionary Accident in Web3D Communications to Integrate Application Components*, Prosiding SIGGRAPH '05 ACM Web Program conference, Article No. 1., Association for Computing Machinery, New York, USA.
- Turonova, B., 2009, *3D Web Technologies And Their Usability for The Project 3D Mobile Internet*, Technical Report, Czech Technical University.
- Vani, V. dan Mohan, S., 2010, *Interactive 3D class room: a framework for Web3D using J3D and JMF*, Prosiding 1st Amrita ACM-W Celebration on Women in Computing in India, Coimbatore, India.
- Vecchio, G. dan Finocchiaro, P., 2012, *3D Interfaces for Real Time Monitoring of Radwaste Storage*, Global Journal of Computer Science and Technology – Graphics & Vision, Volume 12 Issue 12 Version 1.0.



- ViewTec, 2007, *About Virtual Reality*, ViewTec AG, http://viewtec.ch/techdiv/vr_info_e.html
- Visual Technology Services Ltd. 2018. *About U3D*, <https://www.pdf3d.com/u3d>
- Vlachkova, K. dan Boikova, M., 2011, *Interactive 3D Visualization Of Bezier Curves Using Java Open Graphics Library (JOGL)*, Serdica Journal of Computing 5 no 4, pp. 323-332.
- VOPPG, 2011, *Virtual Old Prague*, Virtual Old Prague Project Group, <http://dcgi.fel.cvut.cz/cgg/vsp2/>
- W3C, 2013, *HTML Canvas 2D Context*, W3C, <http://www.w3.org/TR/2dcontext/>
- W3C, 2014a, *HTML5, A vocabulary and associated APIs for HTML and XHTML*, World Wide Web Consortium, <http://www.w3.org/TR/html5/>
- W3C, 2014b, *HTML 5.1 Nightly, A vocabulary and associated APIs for HTML and XHTML*, World Wide Web Consortium, <http://www.w3.org/html/wg/drafts/html/master/>
- W3C, 2017, *HTML 5.2 - W3C Recommendation*, 14 December 2017, World Wide Web Consortium, <https://www.w3.org/TR/html5/>
- W3C, 2018, *An HTML 5 Logo*, World Wide Web Consortium, <https://www.w3.org/html/logo/>
- W3DC, 1996, *An Overview of the Virtual Reality Modeling Language Version 2.0*, Web3D Consortium, <http://www.web3d.org/technicalinfo/specifications/vrml2.0>.
- W3DC, 2002, *The Virtual Reality Modeling Language, Amendment 1 – Enhanced Interoperability*, <http://www.web3d.org/x3d/specifications/vrml/VRML97Am1/>.
- W3DC, 2003a, *Specifications*, Web3D Consortium, http://www.web3d.org/fs_technicalinfo.htm.
- W3DC, 2003b, *VRML Specifications*, Web3D Consortium, http://www.web3d.org/fs_specifications.htm.
- W3DC, 2003c, *The Web3D Repository*, Web3D Consortium, <http://www.web3d.org/vrml/vrml.htm>.
- W3DC, 2003d, *VRML97 Functional Specification and VRML97 External Authoring Interface (EAI)*, Web3D Consortium, <http://www.web3d.org/x3d/specifications/vrml/ISO-IEC-14772-VRML97/>.
- W3DC, 2004, *ISO/IEC 19775:2004 - Extensible 3D (X3D)*, Web3D Consortium, <http://www.web3d.org/x3d/specifications/ISO-IEC-19775-X3DAbstractSpecification/>.
- W3DC, 2005a, *VRML Content Authoring & Editing Tools*, <https://www.web3d.org/x3d/vrml/tools/authoring/>



- W3DC, 2005b, *ISO/IEC 19776-2:2005 - Information technology -- Computer graphics, image processing and environmental data representation -- Extensible 3D (X3D) encodings -- Part 2: Classic VRML encoding*, <https://www.iso.org/standard/38018.html>.
- W3DC, 2006, *The Virtual Reality Modeling Language*, <http://www.web3d.org/documents/specifications/14772/V2.0/index.html>.
- W3DC, 2013, *Extensible 3D (X3D) Part 1: Architecture and base components – Introduction*, <http://www.web3d.org/documents/specifications/19775-1/V3.3/index.html>.
- W3DC, 2017, *X3D & VRML, The Most Widely Used 3D Formats*, <http://www.web3d.org/x3d-vrml-most-widely-used-3d-formats>.
- W3DC, 2018, *X3D Resources*, <http://www.web3d.org/x3d/content/examples/X3dResources.html#Authoring Tools>
- W3DC, 2019, *About Web3D Consortium*, <http://www.web3d.org/about>
- Waerner, M., 2012, *3D Graphics Technologies for Web Applications*, Tesis, Information Coding, Department of Electrical Engineering, Linkoping Institute of Technology, Linkoping, Sweden.
- Wagner, M. G., 2004, *Emerging Technologies in Web-based Virtual Reality*, Prosiding Multimedia Applications in Education Conference, September 13-14 2004, FH JOANNEUM Department for Information Management, Graz University (Austria).
- Walmsley, R., Brutzman, D. dan Carlson, J., 2016, *A JSON encoding for X3D*, Prosiding 21st International Conference on Web3D Technology, Anaheim, California, USA.
- Walsh, A. E., 2003, *Emerging Web3D Web Standards and Technologies*, Prosiding 6th International Conference on Humans and Computers, University of Aizu, Fukushima, Japan.
- Walsh, A. E. dan Bourges-Sévenier, M., 2001, *Core Web3D*, Upper Saddle River, NJ: Prentice Hall PTR.
- Wang, G., Laga, H., Xie, N., Jia, J., dan Tabia, H., 2018a, *The Shape Space of 3D Botanical Tree Models*, ACM Transactions on Graphics, Volume 37, Issue 1, Article no. 7 (January 2018), 18 pages.
- Wang, G., Zhang, D., Zhou, K., dan Jia, J., 2018b, *Rule and Reuse Based Lightweight Modeling and Real Time Web3D Rendering of Forest Scenes*, Prosiding 23rd International ACM Conference on Web3D Technology (Web3D '18), Poznań, Poland, Article 4, 8 pages.
- Wang, L., Xhao, H. S., Chen, W., Yang, C. L. dan Meng, X. X., 2011, *O3D-based personal museum designing system in virtual learning environment*, International Journal Cont. Engineering Education and Life-Long Learning, Vol. 21, No. 1.



UNIVERSITAS
GADJAH MADA

Kerangka Kerja untuk Mengintegrasikan Konten Situs Web3D yang Berbeda Format Menggunakan Metode Multi-Format Distributed World
MURSID WAHYU HANANTO, Dr. techn. Ahmad Ashari, M.I.Kom. ; Dr. techn. Khabib Mustofa, S.Si., M.Kom.
Universitas Gadjah Mada, 2019 | Diunduh dari <http://etd.repository.ugm.ac.id/>

Weiping, X., Qing, Z., Zhiqiang, D., dan Yeting, Z., 2010, *Design and Implementation of 3D Model Database for General-Purpose 3D GIS*, Geo-spatial Information Science, Volume 13, Issue 3, pp. 210-215.

x3dom.org, 2013, *Background*,
<https://doc.x3dom.org/gettingStarted/background/index.html>

x3dom.org, 2013b, *Basic X3D Concepts*,
<https://doc.x3dom.org/gettingStarted/basicX3D/index.html>

x3dom.org, 2013c, *Browser Support*, <https://www.x3dom.org/contact/>

Xu, Z., Zhang, Y., dan Xu, X., 2016, *3D visualization for building information models based upon IFC and WebGL integration*, Multimedia Tools and Applications, Volume 75, Issue 24, Desember 2016, pp. 17421-17441.

Yan, F., 2017, *Improved Ant Colony Algorithms for Multi-agent Path Planning in Web3D Environment*, Otolaryngology Online Journal, Volume 7, Issue 2.

Yan, L. dan Wang, L., 2018, *Research on Virtual Experiment Environment Construction and Teaching Practice Based on Web3D Technology*, Prosiding 8th International Conference on Social science and Education Research (SSER 2018), Xi'an, China, pp. 35-40.

Yu, S., 2015, *Slicing Algorithm of VRML Model in Rapid Prototyping*, Journal of Modeling and Optimization, Volume 7, Number 1, pp. 45-49.

Yunhao, Z., Jun, Z., Weilian, L. I., Ya, H. U., dan Mingwei, L., 2018, *Adaptive Web 3D Visualization for Diverse Terminals*, Prosiding 26th International Conference on Geoinformatics, Kunming, pp. 1-7.

Zhou, G. dan Xia, J., 2018, *OmicsNet: a web-based tool for creation and visual analysis of biological networks in 3D space*, Nucleic Acids Research, Volume 46, Issue W1, 2 July 2018, pp. W514–W522.