

DAFTAR PUSTAKA

- Almqvist, H., Magnusson, M., Kucner, T. P., & Lilienthal, A. J. (2018). Learning to Detect Misaligned Point Clouds. *Journal of Field Robotics*, 35(5), 662–677. <https://doi.org/10.1002/rob.21768>.
- Balis, V., Karamitsos, S., Kotsis, I., Liapakis, C., & Simpas, N. (2004). 3D Laser Scanning: Integration of Point Cloud and CCD Camera Video Data for the Production of High Resolution and Precision RGB Textured Models: Archaeological Monuments Surveying Application in Ancient Ilida. FIG Working Week.
- Balzani, M., Pellegrinelli, A., Perfetti, N., & Ucceli, F. (2002). A Terrestrial 3D Laser Scanner-Accuracy Tests. *International Archives of Photogrammetry Remote Sensing and Spatial Information Sciences*, 34(5/C7), 445–453.
- Barber, D. & Mills, J. (2007). 3D Laser Scanning for Heritage: Advice and Guidance To Users On Laser Scanning In Archaeology And Architecture. English Heritage.
- Barber, D., Mills, J., & Bryan, P. (2003). Towards a Standard Specification for Terrestrial Laser Scanning of Cultural Heritage. *CIPA International Archives for Documentation of Cultural Heritage*, 619–624.
- Barber, D., Mills, J., & Bryan, P. G. (2001). Laser Scanning and Photogrammetry: 21st Century Metrology. *Proceedings of 18th International Symposium CIPA*, 360–366.
- Barnhart, T. B. & Crosby, B. T. (2013). Comparing Two Methods of Surface Change Detection on an Evolving Thermokarst Using High-temporal-frequency Terrestrial Laser Scanning, Selawik River, Alaska. *Remote Sensing*, 5(6), 2813–2837. <https://doi.org/10.3390/rs5062813>.
- Batur, M., Yilmaz, O., & Ozener, H. (2020). A Case Study of Deformation Measurements of Istanbul Land Walls via Terrestrial Laser Scanning. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 13, 6362–6371. <https://doi.org/10.1109/JSTARS.2020.3031675>.
- Besl, P. J. & McKay, N. D. (1992). A Method for Registration Of 3D Shapes. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, 14(2), 239–256. <https://doi.org/10.1109/34.121791>.
- Biasion, A., Moerwald, T., Walser, B., & Walsh, G. (2019, April 22). A New Approach to The Terrestrial Laser Scanner Workflow: The RTC360 Solution. FIG Working Week.
- Boehler, W., Bordas Vicent, M., & Marbs, A. (2003). Investigating Laser Scanner Accuracy. *The International Archivers of Photogrammetry, Remote Sensing and Spatial Information Sciences*, 34, 6969–701.
- Borradaile, G. (2003). *Statistics of Earth Science Data* (1st edition). Springer.
- Brodu, N. & Lague, D. (2012). 3D Terrestrial Lidar Data Classification of Complex Natural Scenes Using a Multi-Scale Dimensionality Criterion: Applications in Geomorphology. *ISPRS Journal of Photogrammetry and Remote Sensing*, 68(1), 121–134. <https://doi.org/10.1016/j.isprsjprs.2012.01.006>.

- Clark, J. & Robson, S. (2004). Accuracy of Measurements Made with a Cyrax 2500 Laser Scanner Against Surfaces of Known Colour. *Survey Review*, 37(294), 626–638. <https://doi.org/10.1179/sre.2004.37.294.626>.
- de By, R. A. & Huisman, O. (2009). *Principles Of Geographic Information Systems: An Introductory Textbook* (4th edition). The International Institute for Geo-Information Science and Earth Observation (ITC).
- DiFrancesco, P. M., Bonneau, D., & Hutchinson, D. J. (2020). The Implications of M3C2 Projection Diameter on 3D Semi-Automated Rockfall Extraction from Sequential Terrestrial Laser Scanning Point Clouds. *Remote Sensing*, 12(11). <https://doi.org/10.3390/rs12111885>.
- Ebeling, A. (2014). *Ground-Based Deformation Monitoring*.
- Fan, C., Chen, M., Wang, X., Wang, J., & Huang, B. (2021). A Review on Data Preprocessing Techniques Toward Efficient and Reliable Knowledge Discovery from Building Operational Data. *Dalam Frontiers in Energy Research* (Vol. 9). Frontiers Media S.A. <https://doi.org/10.3389/fenrg.2021.652801>.
- Fan, H. (2010). *Theory of Errors and Least Squares Adjustment*. Royal Institute of Technology (KTH) Division of Geodesy and Geoinformatics.
- Ghilani, C. D. (2017). *Adjustment Computations: Spatial Data Analysis* (6th Edition). John Wiley & Sons. <https://doi.org/10.1002/9781119390664>.
- Girardeau-Montaut, D., Marc, R., Roux, M., & Thibault, G. (2005). Change Detection on Point Cloud Data Acquired with A Ground Laser Scanner. *International Archives of Photogrammetry, Remote Sensing and Spatial Information Science*, 36, 30–35. <https://www.researchgate.net/publication/228684497>.
- Gordon, S. J. (2005). *Structural Deformation Measurement Using Terrestrial Laser Scanners* [Dissertation]. Curtin University of Technology.
- Gordon, S. J. & Lichti, D. D. (2004). Terrestrial Laser Scanners with A Narrow Field of View: The Effect On 3D Resection Solutions. *Survey Review*, 37(292), 448–468.
- Gordon, S. J., & Lichti, D. D. (2007). Modeling Terrestrial Laser Scanner Data for Precise Structural Deformation Measurement. *Journal of surveying engineering*, 133(2), 72–80.
- He, G. Z., & Yang, J. (2014). Deformation Monitoring for Subway Tunnels Based on TLS. *Advanced Materials Research*, 864–867, 2744–2749. <https://doi.org/10.4028/www.scientific.net/AMR.864-867.2744>.
- Hebert, M. & Krotkov, E. (1992). 3D Measurements from Imaging Laser Radars: How Good Are They? *Image and Vision Computing*, 10(3), 170–178. [https://doi.org/10.1016/0262-8856\(92\)90068-E](https://doi.org/10.1016/0262-8856(92)90068-E).
- Hekimoglu, S., Demirel, H., & Aydin, C. (2002). Reliability of the Conventional Deformation Analysis Methods for Vertical Networks. *FIG XXII International Congress*.
- Holst, C. & Kuhlmann, H. (2016). Challenges and Present Fields of Action at Laser Scanner Based Deformation Analyses. *Journal of Applied Geodesy*, 10(1). <https://doi.org/10.1515/jag-2015-0025>.
- Holst, C., Schmitz, B., & Kuhlmann, H. (2017). Investigating the Applicability of Standard Software Packages for Laser Scanner based Deformation Analyses. *FIG Working Weeks*. www.danielgm.net/cc/.

- Hongfeng, Z. (2020). Feasibility Study of High-precision Trigonometric Elevation Replacing Second-order Level in Tunnel Penetration Control Survey. *E3S Web of Conferences*, 165. <https://doi.org/10.1051/e3sconf/202016504022>
- Huber, D. (2011). The ASTM E57 File Format for 3D Imaging Data Exchange. *Three-Dimensional Imaging, Interaction, and Measurement*, 7864. <https://doi.org/10.1117/12.876555>.
- Ioannidis, C., Valani, A., Georgopoulos, A., & Tsiligiris, E. (2006, Mei). 3D Model Generation for Deformation Analysis using Laser Scanning Data of a Cooling Tower. *FIG Symposium*.
- Jia, D., Zhang, W., & Liu, Y. (2021). Systematic Approach for Tunnel Deformation Monitoring with Terrestrial Laser Scanning. *Remote Sensing*, 13(17). <https://doi.org/10.3390/rs13173519>.
- Jiang, Q., Zhong, S., Pan, P. Z., Shi, Y., Guo, H., & Kou, Y. (2020). Observe The Temporal Evolution of Deep Tunnel's 3D Deformation by 3D Laser Scanning in the Jinchuan No. 2 Mine. *Tunnelling and Underground Space Technology*, 97. <https://doi.org/10.1016/j.tust.2019.103237>.
- Juraev, D., Juraeva, K., & Muslimova, P. (2020). Geodetic Monitoring for Definition of Deformation of Engineering Constructions. *International Journal of Scientific & Technology Research*, 9(02), 1874–1875. www.ijstr.org.
- Kuang, S. (1996). *Geodetic Network Analysis and Optimal Design: Concepts and Applications*.
- Lague, D., Brodu, N., & Leroux, J. (2013). Accurate 3D Comparison of Complex Topography with Terrestrial Laser scanner: Application to The Rangitikei Canyon (N-Z). *ISPRS Journal of Photogrammetry and Remote Sensing*, 82, 10–26. <https://doi.org/10.1016/j.isprsjprs.2013.04.009>.
- Lane, S. N., Westaway, R. M., & Hicks, D. M. (2003). Estimation of Erosion and Deposition Volumes in A Large, Gravel-bed, Braided River Using Synoptic Remote Sensing. *Earth Surface Processes and Landforms*, 28(3), 249–271. <https://doi.org/10.1002/esp.483>.
- Leica Geosystems. (2018a). Leica RTC360 3D Reality Capture Solution. Dalam Leica Geosystems AG. Leica Geosystems AG.
- Leica Geosystems. (2018b). Leica RTC360 User Manual: Vol. Version 1.0 (Version 1.0 English). Leica Geosystems AG.
- Leica Geosystems. (2021). Cyclone REGISTER 360 User Guide. Leica Geosystems AG.
- Leslie, G., Spann, S., Adams, W., Bone, J., McKinney, R., & Benham, J. (2016). 3D Scanning Technology-A Comparative Analysis Part of the MCAA's Construction Technology Research Series.
- Lichti, D. D. (2007). Error modelling, Calibration and Analysis of an AM-CW Terrestrial Laser Scanner System. *ISPRS Journal of Photogrammetry and Remote Sensing*, 61(5), 307–324. <https://doi.org/10.1016/j.isprsjprs.2006.10.004>.
- Lichti, D. D. & Gordon, S. J. (2004). Error Propagation in Directly Georeferenced Terrestrial Laser Scanner Point Clouds for Cultural Heritage Recording.
- Lichti, D. D., Gordon, S. J., & Stewart, M. P. (2002). Ground-Based Laser Scanners: Operation, Systems and Applications. *GEOMATICA*, 56(1), 21–33.
- Lindenbergh, R. & Pfeifer, N. (2006). A Statistical Deformation Analysis of Two Epochs of Terrestrial Laser Data of a Lock.

- Little, M. J. (2006). Slope Monitoring Strategy at Prust Open Pit Operation. International Symposium on Stability of Rock Slopes in Open Pit Mining and Civil Engineering. <https://www.researchgate.net/publication/333209996>.
- Mahmoudabadi, H., Olsen, M. J., & Todorovic, S. (2019). Efficient Terrestrial Laser Scan Segmentation Exploiting Data Structure. *ISPRS Journal of Photogrammetry and Remote Sensing*. <https://doi.org/https://doi.org/10.1016/j.isprsjprs.2016.05.015>.
- Mat Zam, P. M., Fuad, N. A., Yusoff, A. R., & Majid, Z. (2018). Evaluating the Performance of Terrestrial Laser Scanning for Landslide Monitoring. *International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences - ISPRS Archives*, 42(4/W9), 35–55. <https://doi.org/10.5194/isprs-archives-XLII-4-W9-35-2018>.
- McCane, B., Mills, S., Deng, J. D., Association for Computing Machinery, & ACM Digital Library. (2012). Verification of Multi-view Point Cloud Registration for Spherical Harmonic Cross-correlation. *Proceedings of the 27th Conference on Image and Vision Computing New Zealand*, 358–363.
- Mettenleiter, M., Härtl, F., & Fröhlich, C. (2000). Imaging Ladar for 3D Surveying and CAD Modeling of Real-world Environments. *The International Journal of Robotics Research*, 19(11), 1075–1088. <https://doi.org/https://doi.org/10.1177/02783640022067986>.
- Milenković, M., Ressel, C., Hollaus, M., & Pfeifer, N. (2013). Surface Roughness from Point Clouds- A Multi-scale Analysis. *Geophysical Research Abstracts*, 15.
- Mukupa, W., Roberts, G. W., Hancock, C. M., & Al-Manasir, K. (2017). A Review of the Use of Terrestrial Laser Scanning Application for Change Detection and Deformation Monitoring of Structures. *Survey Review*, 49(353), 99–116. <https://doi.org/https://doi.org/10.1080/00396265.2015.1133039>.
- Noll, M. L. & Rydland, P. H. (2020). Procedures and Best Practices for Trigonometric Leveling in the U.S. Geological Survey. U.S. Geological Survey. <https://doi.org/https://doi.org/10.3133/tm11D3>.
- Ohlmann-Lauber, J. & Schäfer, T. (2011). Ansätze Zur Ableitung von Deformationen Aus TLS-Daten. *Terrestrisches Laserscanning–TLS 2011 mit TLS-Challenge*, 147–157.
- Okiemute, E. S. (2020). Detailed Geodetic Technique Procedures for Structural Deformation Monitoring and Analysis. *Analysis. International Journal of Scientific and Technological Research*, 6(7), 7–23. <https://doi.org/10.7176/JSTR/6-07-02i>.
- Pfeifer, N. & Böhm, J. (2008). Early stages of LiDAR data processing. *Advances in Photogrammetry, Remote Sensing, and Spatial Information Sciences: 2008 ISPRS Congress Book*, 187–202.
- Pfeifer, N., Fan, H., Dorninger, P., & Haring, A. (2007). Investigating Terrestrial Laser Scanning Intensity Data: Quality and Functional Relation. <https://www.researchgate.net/publication/242037767>.
- Pfeifer, N. & Lichti, D. (2004). Terrestrial Laser Scanning - Developments, Applications, and Challenges. *GIM International: The Worldwide Magazine for Geomatics*, 18(12), 50–53.
- PUPR. (2018, April 3). Kementerian PUPR Tingkatkan Pelayanan Jalan di Yogyakarta.

- PUPR. (2020). Kementerian PUPR Selesaikan Pembangunan Dua Underpass di Yogyakarta.
- Quintero, M. S., Genechten, B. Van, Bruyne, M. De, Poleman, R., Hankar, M., Barnes, S., Caner, H., Budei, L., Heine, E., Reiner, H., & Garcia, J. L. L. (2008). Theory and Practice on Terrestrial Laser Scanning Training Material Based on Practical Applications Prepared by the Learning Tools for Advanced Three-dimensional Surveying in Risk Awareness Project (3DRiskMapping) (Version 3.6).
- Ramdhani, A., Ramdhani, M. A., & Amin, A. S. (2014). Writing a Literature Review Research Paper: A Step-by-step Approach. *International Journal of Basics and Applied Sciences*, 03(01), 47–56. www.insikapub.com.
- Razak, A. H. (2021, Juni 1). Ternyata Ini Penyebab Underpass Kentungan Banjir 25 cm. *Harian Jogja*.
- Reddington, J. (2005). HDS Training Manual. Leica geosystem.
- Reshetyuk, Y. (2009). Self-calibration and Direct Georeferencing in Terrestrial Laser Scanning. Royal Institute of Technology.
- Salvi, J., Matabosch, C., Fofi, D., & Forest, J. (2007). A Review of Recent Range Image Registration Methods with Accuracy Evaluation. *Image and Vision Computing*, 25(5), 578–596.
- Schneider, D. (2006). Terrestrial Laser Scanning for Area Based Deformation Analysis of Towers and Water Dams. *FIG Symposium*.
- Schuhmacher, S. & Bohm, J. (2005). Georeferencing of Terrestrial Laser Scanner Data for Application in Architectural Modelling. *International Archiver of Photogrammetry, Remote Sensing and Spatial Information Sciences*. <https://www.researchgate.net/publication/251319871>.
- Schulz, T. & Ingensand, H. (2004). Terrestrial Laser Scanning - Investigations and Applications for High Precision Scanning. *FIG Working Week 2004*.
- Setiawan, A. (2023). Visualisasi Permukaan Terowongan Underpass Kentungan Menggunakan Terrestrial Laser Scanner (TLS) [Postgraduate Thesis]. Universitas Gadjah Mada.
- Soudarissanane, S., Bucksch, A., Lindenbergh, R. C., van Ree, J., & Lindenbergh, R. (2007). Error Budget of Terrestrial Laser Scanning: Influence of the Incidence Angle on the Scan Quality. <https://doi.org/10.13140/RG.2.1.1877.6404>.
- Soudarissanane, S., Lindenbergh, R., & Gorte, B. (2008). Reducing the Error in Terrestrial Laser Scanning by Optimizing the Measurement Set-up. *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Science*, XXXVII, 615–620. <http://www.deos.tudelft.nl/>.
- Sunartono. (2017, Maret 14). Underpass Kentungan & Gejayan: Sehari 20.000 Kendaraan Melintas, Kemacetan Terjadi Setiap Hari. *SOLOPOS.com*.
- Teng, J., Shi, Y., Wang, H., & Wu, J. (2022). Review on the Research and Applications of TLS in Ground Surface and Constructions Deformation Monitoring. *Sensors*, 22(23), 9179. <https://doi.org/10.3390/s22239179>.
- Theses, D. & Bryan Herring, G. (2018). Scholars Junction Scholars Junction Application of Terrestrial Laser Scanning in Identifying Application of Terrestrial Laser Scanning in Identifying Deformation in Thin Arch Dams. <https://scholarsjunction.msstate.edu/td>.
- Truong-Hong, L. & Laefer, D. F. (2014). Application of Terrestrial Laser Scanner in Bridge Inspection: Review and an Opportunity. *International Association for*

- Bridge and Structural Engineering Symposium Report, 2713–2720.
<https://doi.org/10.2749/222137814814070190>.
- US Army Corps of Engineers. (2018). Structural Deformation Surveying.
- van Goor, B. (2011). Change Detection and Deformation Analysis Using Terrestrial Laser Scanning [Thesis]. Delft University of Tehcnology.
- Wang, W., Zhao, W., Huang, L., Vimarlund, V., & Wang, Z. (2014). Applications of Terrestrial Laser Scanning for Tunnels: A Review. *Journal of Traffic and Transportation Engineering (English Edition)*, 1(5), 325–337.
[https://doi.org/10.1016/S2095-7564\(15\)30279-8](https://doi.org/10.1016/S2095-7564(15)30279-8).
- Watson, G. A. (2006). Computing Helmert Transformations. *Journal of Computational and Applied Mathematics*, 197(2), 387–394.
<https://doi.org/10.1016/j.cam.2005.06.047>.
- Wheaton, J. M., Brasington, J., Darby, S. E., & Sear, D. A. (2010). Accounting for Uncertainty in DEMs From Repeat Topographic Surveys: Improved Sediment Budgets. *Earth Surface Processes and Landforms*, 35(2), 136–156.
<https://doi.org/10.1002/esp.1886>.
- Wunderlich, T., Niemeier, W., Wujanz, D., & Holst, C. (2006). Areal Deformation Analysis from TLS Point Clouds - The Challenge.
<https://www.researchgate.net/publication/311795322>.
- Xie, X. & Lu, X. (2017). Development of a 3D Modeling Algorithm for Tunnel Deformation Monitoring Based on Terrestrial Laser Scanning. *Underground Space (China)*, 2(1), 16–29. <https://doi.org/10.1016/j.undsp.2017.02.001>.
- Xu, G., Pang, Y., Bai, Z., Wang, Y., & Lu, Z. (2021). A Fast Point Clouds Registration Algorithm for Laser Scanners. *Applied Sciences (Switzerland)*, 11(8).
<https://doi.org/10.3390/app11083426>.
- Yuan, Y., Ge, Z., Lai, B., Guo, X., Zhang, Y., Liu, X., Suo, T., & Yu, Q. (2023). Three Dimensional Deformation Measurement Method Based on Image Guided Point Cloud Registration. *Optics and Lasers in Engineering*, 161.
<https://doi.org/10.1016/j.optlaseng.2022.107399>
- Zogg, H. M. (2008). Investigations of High Precision Terrestrial Laser Scanning with Emphasis on the Development of a Robust Close-Range 3D-Laser Scanning System [Doctoral Thesis]. ETH Zurich.