

DAFTAR PUSTAKA

- Abbas, K., & Mahmud, R. S. (2015). Edge detection based on the Shannon Entropy by piecewise thresholding on remote sensing images. *IET Journals The Institution of Engineering and Technology*. <https://doi.org/10.1049/iet-cvi.2013.0192>
- Abdel Raheem, S. E., Ahmed, M. M. M., Ahmed, M. M., & Abdel-Shafy, A. G. A. (2017). Seismic performance of L-shaped multi-storey buildings with moment-resisting frames. *Proceedings of the Institution of Civil Engineers - Structures and Buildings*, 171(5), 395–408. <https://doi.org/10.1680/jstbu.16.00122>
- Abdel Raheem, S. E., Ahmed, M. M. M., Ahmed, M. M., & Abdel-shafy, A. G. A. (2018). Evaluation of plan configuration irregularity effects on seismic response demands of L-shaped MRF buildings. *Bulletin of Earthquake Engineering*, 16(9), 3845–3869. <https://doi.org/10.1007/s10518-018-0319-7>
- Abdollahi, A., Pradhan, B., Shukla, N., Chakraborty, S., & Alamri, A. (2020). Deep Learning Approaches Applied to Remote Sensing Datasets for Road Extraction: A State-Of-The-Art Review. *Remote Sensing*, 12(9), Article 9. <https://doi.org/10.3390/rs12091444>
- Abdulateef, S., & Salman, M. (2021). A Comprehensive Review of Image Segmentation Techniques. *Iraqi Journal for Electrical and Electronic Engineering*, 17(2), 166–175. <https://doi.org/10.37917/ijeee.17.2.18>
- Adriano, B., Xia, J., Baier, G., Yokoya, N., & Koshimura, S. (2019). Multi-Source Data Fusion Based on Ensemble Learning for Rapid Building Damage Mapping during the 2018 Sulawesi Earthquake and Tsunami in Palu, Indonesia. *Remote Sensing*, 11(7), Article 7. <https://doi.org/10.3390/rs11070886>
- Adriano, B., Yokoya, N., Xia, J., Miura, H., Liu, W., Matsuoka, M., & Koshimura, S. (2021). Learning from multimodal and multitemporal earth observation data for building damage mapping. *ISPRS Journal of Photogrammetry and Remote Sensing*, 175, 132–143. <https://doi.org/10.1016/j.isprsjprs.2021.02.016>
- Afida, B. A., Kamal, M., & Hadmoko, D. S. (2020). IDENTIFIKASI KERUSAKAN BANGUNAN PASCA GEMPA BUMI MENGGUNAKAN CITRA SATELIT WORLDVIEW-2. *Jurnal Pengembangan Kota*, 8(1), 67–77. <https://doi.org/10.14710/jpk.8.1.67-77>
- Agbangba, C. E., Sacla Aide, E., Honfo, H., & Glèlè Kakai, R. (2024). On the use of post-hoc tests in environmental and biological sciences: A critical review. *Heliyon*, 10(3), e25131. <https://doi.org/10.1016/j.heliyon.2024.e25131>
- Aggarwal, N., Srivastava, M., & Dutta, M. (2016). Comparative Analysis of Pixel-Based and Object-Based Classification of High Resolution Remote Sensing Images – A Review. *International Journal of Engineering Trends and Technology*, 38(1), 5–11. <https://doi.org/10.14445/22315381/IJETT-V38P202>
- AHA Centre. (2018, October 26). SITUATION UPDATE No. 15—Sulawesi Earthquake—26 October 2018. *AHA Centre*. <https://ahacentre.org/situation-update/situation-update-no-15-sulawesi-earthquake-26-october-2018/>
- Ahmed, M., Hashmi, K. A., Pagani, A., Liwicki, M., Stricker, D., & Afzal, M. Z. (2021a). Survey and Performance Analysis of Deep Learning Based Object Detection in Challenging Environments. *Sensors*, 21(15), 5116. <https://doi.org/10.3390/s21155116>
- Ahmed, M., Hashmi, K. A., Pagani, A., Liwicki, M., Stricker, D., & Afzal, M. Z. (2021b). Survey and Performance Analysis of Deep Learning Based Object Detection in

- Challenging Environments. *Sensors*, 21(15), 5116. <https://doi.org/10.3390/s21155116>
- Ahmed, M. M. M., Abdel Raheem, S. E., Ahmed, M. M., & Abdel Shafy, A. G. A. (2016). IRREGULARITY EFFECTS ON THE SEISMIC PERFORMANCE OF L-SHAPED MULTI-STORY BUILDINGS. *JES. Journal of Engineering Sciences*, 44(5), 513–536. <https://doi.org/10.21608/jesaun.2016.111440>
- Alakian, A., & Achard, V. (2020). Classification of Hyperspectral Reflectance Images With Physical and Statistical Criteria. *Remote Sensing*, 12(14), 2335. <https://doi.org/10.3390/rs12142335>
- Alisjahbana, I., Li, J., Ben, Strong, & Zhang, Y. (2024a). *DeepDamageNet: A two-step deep-learning model for multi-disaster building damage segmentation and classification using satellite imagery* (No. arXiv:2405.04800). arXiv. <https://doi.org/10.48550/arXiv.2405.04800>
- Alisjahbana, I., Li, J., Ben, Strong, & Zhang, Y. (2024b). *DeepDamageNet: A two-step deep-learning model for multi-disaster building damage segmentation and classification using satellite imagery* (No. arXiv:2405.04800). arXiv. <https://doi.org/10.48550/arXiv.2405.04800>
- Alisjahbana, I., Li, J., Ben, Strong, & Zhang, Y. (2024c, May 8). *DeepDamageNet: A two-step deep-learning model for multi-disaster building damage segmentation and classification using satellite imagery*. arXiv.org. <https://arxiv.org/abs/2405.04800v1>
- Alkan, M. (2018). *Information content analysis from very high resolution optical space imagery for updating spatial database*. 42(4), 24–31. Scopus. <https://doi.org/10.5194/isprs-archives-XLII-4-25-2018>
- Anoopa, S., & Manikandan, L. C. (2020). Survey on image segmentation in remote sensing satellite images. *International Journal of Advanced Science and Technology*, 29(1), 502–512. Scopus.
- Arafın, P., Billah, A. M., & Issa, A. (2024). Deep learning-based concrete defects classification and detection using semantic segmentation. *Structural Health Monitoring*, 23(1), 383–409. <https://doi.org/10.1177/14759217231168212>
- Aránguiz, R., Esteban, M., Takagi, H., Mikami, T., Takabatake, T., Gómez, M., González, J., Shibayama, T., Okuwaki, R., Yagi, Y., Shimizu, K., Achiari, H., Stolle, J., Robertson, I., Ohira, K., Nakamura, R., Nishida, Y., Krautwald, C., Goseberg, N., & Nistor, I. (2020). The 2018 Sulawesi tsunami in Palu city as a result of several landslides and coseismic tsunamis. *Coastal Engineering Journal*, 62(4), 445–459. <https://doi.org/10.1080/21664250.2020.1780719>
- Aytekin, Ö., Erener, Arzu, Ulusoy, İlkay, & and Düzgün, Ş. (2012). Unsupervised building detection in complex urban environments from multispectral satellite imagery. *International Journal of Remote Sensing*, 33(7), 2152–2177. <https://doi.org/10.1080/01431161.2011.606852>
- Bai, H., Bai, T., Li, W., & Liu, X. (2021). A Building Segmentation Network Based on Improved Spatial Pyramid in Remote Sensing Images. *Applied Sciences*, 11(11), 5069. <https://doi.org/10.3390/app11115069>
- Benchabana, A., Kholadi, M.-K., Bensaci, R., Khaldi, B., Benchabana, A., Kholadi, M.-K., Bensaci, R., & Khaldi, B. (2023). Building Detection in High-Resolution Remote Sensing Images by Enhancing Superpixel Segmentation and Classification Using Deep Learning Approaches. *Buildings*, 13(7). <https://doi.org/10.3390/buildings13071649>
- Bevington, J. S., Eguchi, R. T., Gill, S., Ghosh, S., & Huyck, C. K. (2015). A comprehensive analysis of building damage in the 2010 haiti earthquake using

- high-Resolution imagery and crowdsourcing. In *Time-Sensitive Remote Sensing* (pp. 131–145). Scopus. https://doi.org/10.1007/978-1-4939-2602-2_9
- Bilham, R. (2009). The seismic future of cities. *Bulletin of Earthquake Engineering*, 7(4), 839–887. <https://doi.org/10.1007/s10518-009-9147-0>
- Blaschke, T. (2010). Object based image analysis for remote sensing. *ISPRS Journal of Photogrammetry and Remote Sensing*, 65(1), 2–16. <https://doi.org/10.1016/j.isprsjprs.2009.06.004>
- BMKG. (2018). *Gempa Bumi Tektonik M7,7 Sulawesi Tengah (PRESS RELEASE)* (No. UM.505/9/D3/IX/2018). BMKG. <https://www.bmkg.go.id/siaran-pers/gempabumi-tektunik-m7-7-kabupaten-donggala-sulawesi-tengah-pada-hari-jumat-28-september-2018-berpotensi-tsunami>
- Brunner, D., Lemoine, G., & Bruzzone, L. (2010). Earthquake Damage Assessment of Buildings Using VHR Optical and SAR Imagery. *IEEE Transactions on Geoscience and Remote Sensing*, 48(5), 2403–2420. <https://doi.org/10.1109/TGRS.2009.2038274>
- Brunner, E., Konietzschke, F., Bathke, A. C., & Pauly, M. (2021). Ranks and Pseudo-ranks—Surprising Results of Certain Rank Tests in Unbalanced Designs. *International Statistical Review*, 89(2), 349–366. <https://doi.org/10.1111/insr.12418>
- Buda, M., Maki, A., & Mazurowski, M. A. (2018). A systematic study of the class imbalance problem in convolutional neural networks. *Neural Networks*, 106, 249–259. <https://doi.org/10.1016/j.neunet.2018.07.011>
- Cao, D., Xing, H., Wong, M. S., Kwan, M.-P., Xing, H., & Meng, Y. (2021). A Stacking Ensemble Deep Learning Model for Building Extraction from Remote Sensing Images. *Remote Sensing*, 13(19), Article 19. <https://doi.org/10.3390/rs13193898>
- Cetin, M., Ozcan Tatar, C., Ozturk, Y., Agacsapan, B., Khoda Karimi, Z., Ozenen Kavlak, M., Senyel Kurkcuoglu, M. A., Dabanli, A., Cabuk, A., Kucukpehlivan, T., & Cabuk, S. N. (2025). Assessing Earthquake-Induced Vulnerability of Critical Infrastructure in Kahramanmaraş Using Geographic Information Systems and Remote Sensing Technologies. *Journal of the Indian Society of Remote Sensing*, 53(1), 169–183. Scopus. <https://doi.org/10.1007/s12524-024-01975-2>
- Chandrasekhar, A. (2023). *PolyTO: Structural Topology Optimization using Convex Polygons* (No. arXiv:2305.04406). arXiv. <https://doi.org/10.48550/arXiv.2305.04406>
- Chen, B. (2024). Research Overview of YOLO Series Object Detection Algorithms Based on Deep Learning. *Journal of Computing and Electronic Information Management*, 15(3), Article 3. <https://doi.org/10.54097/p81rtv77>
- Chen, F., Sun, Yao, Wang, Lei, Wang, Ning, Zhao, Huichen, & Yu, B. (2024). HRTBDA: A network for post-disaster building damage assessment based on remote sensing images. *International Journal of Digital Earth*, 17(1), 2418880. <https://doi.org/10.1080/17538947.2024.2418880>
- Chen, J., Xiao, Y., Guo, Y., Li, M., Li, X., Zhang, X., Hao, F., Pu, X., & Fu, Y. (2024). Detecting sun glint in UAV RGB images at different times using a deep learning algorithm. *Ecological Informatics*, 81, 102660. <https://doi.org/10.1016/j.ecoinf.2024.102660>
- Chen, L.-C., Papandreou, G., Schroff, F., & Adam, H. (2017). *Rethinking Atrous Convolution for Semantic Image Segmentation* (No. arXiv:1706.05587). arXiv. <https://doi.org/10.48550/arXiv.1706.05587>
- Cipta, A., Robiana, R., Griffin, J. D., Horspool, N., Hidayati, S., & Cummins, P. (2017). A probabilistic seismic hazard assessment for Sulawesi, Indonesia. *Geological*

- Society Special Publication*, 441(1), 133–152. Scopus. <https://doi.org/10.1144/SP441.6>
- CSRP. (2024). *LAPORAN AKHIR STUDI TEMATIK KAPASITAS PEMERINTAH DAERAH DALAM PENANGGULANGAN BENCANA (TSLGC) 2024*. CSRP & PUPR. https://sitaba.pu.go.id/user/file/2025_02_03_02_25_56.846122_file.pdf
- Dadrass Javan, F., Samadzadegan, F., Mehravar, S., Toosi, A., Khatami, R., & Stein, A. (2021). A review of image fusion techniques for pan-sharpening of high-resolution satellite imagery. *ISPRS Journal of Photogrammetry and Remote Sensing*, 171, 101–117. <https://doi.org/10.1016/j.isprsjprs.2020.11.001>
- Dang, H. V., Park, H., Shin, S., Ha, T., & Cox, D. T. (2024). Numerical modeling and assessment of flood mitigation structures in idealized coastal communities: OpenFOAM simulations for hydrodynamics and pressures on the buildings. *Ocean Engineering*, 307, 118147. <https://doi.org/10.1016/j.oceaneng.2024.118147>
- de Carvalho, O. L. F., de Carvalho Júnior, O. A., Silva, C. R. e, de Albuquerque, A. O., Santana, N. C., Borges, D. L., Gomes, R. A. T., & Guimarães, R. F. (2022). Panoptic Segmentation Meets Remote Sensing. *Remote Sensing*, 14(4), Article 4. <https://doi.org/10.3390/rs14040965>
- De, S., & Dhang, N. (2019). A Literature Review on Building Typology and Their Failure Occurrences. *Journal of The Institution of Engineers (India): Series A*, 100, 177–190. <https://doi.org/10.1007/s40030-018-0326-3>
- Dikshit, A., Pradhan, B., & Alamri, A. M. (2021). Pathways and challenges of the application of artificial intelligence to geohazards modelling. *Gondwana Research*, 100, 290–301. <https://doi.org/10.1016/j.gr.2020.08.007>
- Dong, L., & Shan, J. (2013a). A comprehensive review of earthquake-induced building damage detection with remote sensing techniques. *ISPRS Journal of Photogrammetry and Remote Sensing*, 84, 85–99. <https://doi.org/10.1016/j.isprsjprs.2013.06.011>
- Dong, L., & Shan, J. (2013b). A comprehensive review of earthquake-induced building damage detection with remote sensing techniques. *ISPRS Journal of Photogrammetry and Remote Sensing*, 84, 85–99. <https://doi.org/10.1016/j.isprsjprs.2013.06.011>
- Du, M., Sui, J., Hui, J., Qin, Q., & Ye, X. (2019). Effective Building Extraction From High-Resolution Remote Sensing Images With Multitask Driven Deep Neural Network. *IEEE Geoscience and Remote Sensing Letters*, 16, 786–790. <https://doi.org/10.1109/LGRS.2018.2880986>
- E., R., Hebbar, R., & P., S. (2018). Buildings Detection from Very High Resolution Satellite Images Using Segmentation and Morphological Operations. *2018 International Conference on Design Innovations for 3Cs Compute Communicate Control (ICDI3C)*, 106–110. <https://doi.org/10.1109/ICDI3C.2018.00031>
- Ekiz, S., & Acar, U. (2025). Improving building extraction from high-resolution aerial images: Error correction and performance enhancement using deep learning on the Inria dataset. *Science Progress*, 108(1), 00368504251318202. <https://doi.org/10.1177/00368504251318202>
- EMS. (2025). “Copernicus Emergency Management Service.” Directorate Space, Security and Migration, European Commission Joint Research Centre (EC JRC). <https://emergency.copernicus.eu/>
- Foroughnia, F., Macchiarulo, V., Berg, L., DeJong, M., Milillo, P., Hudnut, K. W., Gavin, K., & Giardina, G. (2024). Quantitative assessment of earthquake-induced building damage at regional scale using LiDAR data. *International Journal of Disaster Risk Reduction*, 106, 104403. <https://doi.org/10.1016/j.ijdrr.2024.104403>

- Gao, J., Chen, Y., Wei, Y., & Li, J. (2021). Detection of Specific Building in Remote Sensing Images Using a Novel YOLO-S-CIOU Model. Case: Gas Station Identification. *Sensors*, 21(4), Article 4. <https://doi.org/10.3390/s21041375>
- Gao, J., Chen, Y., Wei, Y., Li, J., Gao, J., Chen, Y., Wei, Y., & Li, J. (2021). Detection of Specific Building in Remote Sensing Images Using a Novel YOLO-S-CIOU Model. Case: Gas Station Identification. *Sensors*, 21(4). <https://doi.org/10.3390/s21041375>
- Ge, J., Tang, H., Yang, N., & Hu, Y. (2023a). Rapid identification of damaged buildings using incremental learning with transferred data from historical natural disaster cases. *ISPRS Journal of Photogrammetry and Remote Sensing*, 195, 105–128. <https://doi.org/10.1016/j.isprsjprs.2022.11.010>
- Ge, J., Tang, H., Yang, N., & Hu, Y. (2023b). Rapid identification of damaged buildings using incremental learning with transferred data from historical natural disaster cases. *ISPRS Journal of Photogrammetry and Remote Sensing*, 195, 105–128. <https://doi.org/10.1016/j.isprsjprs.2022.11.010>
- Geus, D. de, Meletis, P., & Dubbelman, G. (2019). *Panoptic Segmentation with a Joint Semantic and Instance Segmentation Network* (No. arXiv:1809.02110). arXiv. <https://doi.org/10.48550/arXiv.1809.02110>
- Ghaffarian, S., & Kerle, N. (2019). TOWARDS POST-DISASTER DEBRIS IDENTIFICATION FOR PRECISE DAMAGE AND RECOVERY ASSESSMENTS FROM UAV AND SATELLITE IMAGES. *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences, XLII-2-W13*, 297–302. ISPRS Geospatial Week 2019 (Volume XLII-2/W13) - 10–14 June 2019, Enschede, The Netherlands. <https://doi.org/10.5194/isprs-archives-XLII-2-W13-297-2019>
- Ghali, R., & Akhloufi, M. A. (2023). Deep Learning Approaches for Wildland Fires Remote Sensing: Classification, Detection, and Segmentation. *Remote Sensing*, 15(7), Article 7. <https://doi.org/10.3390/rs15071821>
- Ghanem, A., Lee, Y.-J., & Moon, D.-S. (2024). Seismic Vulnerability of Reinforced Concrete Frame Structures: Obtaining Plan or Vertical Mass Irregularity from Structure Use Change. *Journal of Structural Engineering*, 150(3), 04023243. <https://doi.org/10.1061/JSENDH.STENG-12440>
- Ghosh Mondal, T., Jahanshahi, M. R., Wu, R.-T., & Wu, Z. Y. (2020). Deep learning-based multi-class damage detection for autonomous post-disaster reconnaissance. *Structural Control and Health Monitoring*, 27(4), e2507. <https://doi.org/10.1002/stc.2507>
- Girshick, R., Donahue, J., Darrell, T., & Malik, J. (2014). Rich Feature Hierarchies for Accurate Object Detection and Semantic Segmentation. *2014 IEEE Conference on Computer Vision and Pattern Recognition*, 580–587. <https://doi.org/10.1109/CVPR.2014.81>
- Gu, J., Xie, Z., Zhang, J., & He, X. (2024a). Advances in Rapid Damage Identification Methods for Post-Disaster Regional Buildings Based on Remote Sensing Images: A Survey. *Buildings*, 14(4), 898. <https://doi.org/10.3390/buildings14040898>
- Gu, J., Xie, Z., Zhang, J., & He, X. (2024b). Advances in Rapid Damage Identification Methods for Post-Disaster Regional Buildings Based on Remote Sensing Images: A Survey. *Buildings*, 14(4), Article 4. <https://doi.org/10.3390/buildings14040898>
- Guan, L. (2023). *Weight Prediction Boosts the Convergence of AdamW* (No. arXiv:2302.00195). arXiv. <https://doi.org/10.48550/arXiv.2302.00195>

- Guan, L., Li, D., Shi, Y., & Meng, J. (2024). *XGrad: Boosting Gradient-Based Optimizers With Weight Prediction* (No. arXiv:2305.18240). arXiv. <https://doi.org/10.48550/arXiv.2305.18240>
- Gui, S., Song, S., Qin, R., & Tang, Y. (2024). Remote Sensing Object Detection in the Deep Learning Era—A Review. *Remote Sensing*, 16(2), Article 2. <https://doi.org/10.3390/rs16020327>
- Guirado, E., Blanco-Sacristán, J., Rodríguez-Caballero, E., Tabik, S., Alcaraz-Segura, D., Martínez-Valderrama, J., & Cabello, J. (2021). Mask R-CNN and OBIA Fusion Improves the Segmentation of Scattered Vegetation in Very High-Resolution Optical Sensors. *Sensors*, 21(1), Article 1. <https://doi.org/10.3390/s21010320>
- Guo, S., Yang, Q., Xiang, S., Wang, S., & Wang, X. (2024). Mask2Former with Improved Query for Semantic Segmentation in Remote-Sensing Images. *Mathematics*, 12(5), Article 5. <https://doi.org/10.3390/math12050765>
- Guo, Z., Wu, G., Song, X., Yuan, W., Chen, Q., Zhang, H., Shi, X., Xu, M., Xu, Y., Shibasaki, R., & Shao, X. (2019). Super-Resolution Integrated Building Semantic Segmentation for Multi-Source Remote Sensing Imagery. *IEEE Access*, 7, 99381–99397. <https://doi.org/10.1109/ACCESS.2019.2928646>
- Gupta, R., Hosfelt, R., Sajeev, S., Patel, N., Goodman, B., Doshi, J., Heim, E., Choset, H., & Gaston, M. (2019). *xBD: A Dataset for Assessing Building Damage from Satellite Imagery* (No. arXiv:1911.09296). arXiv. <https://doi.org/10.48550/arXiv.1911.09296>
- Hao, X., Liu, L., Yang, R., Yin, L., Zhang, L., & Li, X. (2023). A Review of Data Augmentation Methods of Remote Sensing Image Target Recognition. *Remote Sensing*, 15(3), 827. <https://doi.org/10.3390/rs15030827>
- Harijoko, A., Anggraini, A., Setianto, A., Hendratno, A., Solikhin, A., Omang, A., Puji, A. R., Cipta, A., Diambama, A. D., Natawidjaja, D. H., Daryono, Islamiyati, D., Barianto, D. H., Sarsito, D. A., Amijaya, D. H., Ngadmanto, D., Karnawati, D., Handini, E., Marliyani, G. I., ... Yulaikhah. (2024). *Geologi Gempa Bumi Indonesia*. UGM PRESS.
- He, L., Zhou, Y., Liu, L., Cao, W., & Ma, J. (2025). Research on object detection and recognition in remote sensing images based on YOLOv11. *Scientific Reports*, 15(1), 14032. <https://doi.org/10.1038/s41598-025-96314-x>
- He, Y., Wang, J., Liao, C., Zhou, X., & Shan, B. (2023). MS4D-Net: Multitask-Based Semi-Supervised Semantic Segmentation Framework with Perturbed Dual Mean Teachers for Building Damage Assessment from High-Resolution Remote Sensing Imagery. *Remote Sensing*, 15(2), 478. <https://doi.org/10.3390/rs15020478>
- Higuera, P., Sepúlveda, I., & Liu, P. L.-F. (2022). Filling in the Gaps of the Tsunamigenic Sources in 2018 Palu Bay Tsunami. In S. Kolathayar, I. Pal, S. C. Chian, & A. Mondal (Eds.), *Civil Engineering for Disaster Risk Reduction* (pp. 439–459). Springer Nature. https://doi.org/10.1007/978-981-16-5312-4_29
- Hossain, M. D., & Chen, D. (2019). Segmentation for Object-Based Image Analysis (OBIA): A review of algorithms and challenges from remote sensing perspective. *ISPRS Journal of Photogrammetry and Remote Sensing*, 150, 115–134. <https://doi.org/10.1016/j.isprsjprs.2019.02.009>
- Hosseinpour, H., Samadzadegan, F., & Javan, F. D. (2022a). CMGFNet: A deep cross-modal gated fusion network for building extraction from very high-resolution remote sensing images. *ISPRS Journal of Photogrammetry and Remote Sensing*, 184, 96–115. <https://doi.org/10.1016/j.isprsjprs.2021.12.007>
- Hosseinpour, H., Samadzadegan, F., & Javan, F. D. (2022b). CMGFNet: A deep cross-modal gated fusion network for building extraction from very high-resolution

- remote sensing images. *ISPRS Journal of Photogrammetry and Remote Sensing*, 184, 96–115. <https://doi.org/10.1016/j.isprsjprs.2021.12.007>
- Hu, M., Yin, W., Diao, W., Gao, X., & Sun, X. (2025). A Class-Incremental Object Detection Method for Remote Sensing Images Based on Dynamic Multiprototype Matching. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 18, 5157–5171. <https://doi.org/10.1109/JSTARS.2024.3520831>
- Hu, Y., Barberopoulou, A., & Koch, M. (2025). Tracing the 2018 Sulawesi Earthquake and Tsunami's Impact on Palu, Indonesia: A Remote Sensing Analysis. *Journal of Marine Science and Engineering*, 13(1), Article 1. <https://doi.org/10.3390/jmse13010178>
- Huang, D., Tang, Y., & Qin, R. (2022). An evaluation of PlanetScope images for 3D reconstruction and change detection – experimental validations with case studies. *GIScience & Remote Sensing*, 59(1), 744–761. <https://doi.org/10.1080/15481603.2022.2060595>
- Huang, J., Xia, G.-S., Hu, F., & Zhang, L. (2018). Accurate Building Detection in VHR Remote Sensing Images Using Geometric Saliency. *IGARSS 2018 - 2018 IEEE International Geoscience and Remote Sensing Symposium*, 3991–3994. <https://doi.org/10.1109/IGARSS.2018.8517331>
- Huang, X., & Zhang, L. (2011). A Multidirectional and Multiscale Morphological Index for Automatic Building Extraction from Multispectral GeoEye-1 Imagery. *Photogrammetric Engineering & Remote Sensing*, 77(7), 721–732. <https://doi.org/10.14358/PERS.77.7.721>
- Huang, X., & Zhang, L. (2012). Morphological Building/Shadow Index for Building Extraction From High-Resolution Imagery Over Urban Areas. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 5(1), 161–172. <https://doi.org/10.1109/JSTARS.2011.2168195>
- Huang, X., Zhu, X. X., Dell'acqua, F., Fauvel, M., Dalla Mura, M., & Lombardini, F. (2019). Foreword to the Special Issue on Recent Advances in Processing of High-Spatial-Resolution Remote Sensing Data. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 12(8), 2588–2593. Scopus. <https://doi.org/10.1109/JSTARS.2019.2936980>
- Huo, C., Chen, K., Zhang, S., Wang, Z., Yan, H., Shen, J., Hong, Y., Qi, G., Fang, H., & Wang, Z. (2025). When Remote Sensing Meets Foundation Model: A Survey and Beyond. *Remote Sensing*, 17(2), Article 2. <https://doi.org/10.3390/rs17020179>
- Jensen, J. R. (2014). *Remote sensing of the environment: An earth resource perspective* (Pearson new international, second edition). Pearson.
- Johnson, J. M., & Khoshgoftaar, T. M. (2019). Survey on deep learning with class imbalance. *Journal of Big Data*, 6(1), 27. <https://doi.org/10.1186/s40537-019-0192-5>
- JRC. (2018). *JRC Emergency Reporting—Activation #021—Update #1—01 Oct 2018* (No. Activation #021). European Commission. https://www.gdacs.org/documentmaps_IP.aspx?eventid=1157757&eventtype=EQ
- Kaku, K. (2021). *A Holistic Case-Study Approach to Applying Satellite Remote Sensing to Disaster Management*. Cambridge Scholars Publishing.
- Kang, J., Fernandez-Beltran, R., Sun, X., Ni, J., & Plaza, A. (2022). Deep Learning-Based Building Footprint Extraction With Missing Annotations. *IEEE Geoscience and Remote Sensing Letters*, 19, 1–5. <https://doi.org/10.1109/LGRS.2021.3072589>
- Kaptein, A., Janoth, J., Lang, O., & Bernede, N. (2014). Trends in commercial radar remote sensing industry. *IEEE Geoscience and Remote Sensing Magazine*, 2(1), 42–46. Scopus. <https://doi.org/10.1109/MGRS.2014.2304632>

- Kaur, G., Saini, K. S., Singh, D., & Kaur, M. (2021). A Comprehensive Study on Computational Pansharpening Techniques for Remote Sensing Images. *Archives of Computational Methods in Engineering*, 28(7), 4961–4978. <https://doi.org/10.1007/s11831-021-09565-y>
- Kerle, N., Nex, F., Gerke, M., Duarte, D., Vetrivel, A., Kerle, N., Nex, F., Gerke, M., Duarte, D., & Vetrivel, A. (2019). UAV-Based Structural Damage Mapping: A Review. *ISPRS International Journal of Geo-Information*, 9(1). <https://doi.org/10.3390/ijgi9010014>
- Khanal, B., & Chaulagain, H. (2020). Seismic elastic performance of L-shaped building frames through plan irregularities. *Structures*, 27, 22–36. <https://doi.org/10.1016/j.istruc.2020.05.017>
- Khanam, R., & Hussain, M. (2024). *YOLOv11: An Overview of the Key Architectural Enhancements* (No. arXiv:2410.17725; Version 1). arXiv. <https://doi.org/10.48550/arXiv.2410.17725>
- Kindangen, J. I., Rogi, O. H., Gosal, P. H., & Mandey, J. C. (2024). Thermal performance survey on housing in Manado: Roof construction and occupants' heat stress. *AIP Conference Proceedings*, 2710(1), 020003. <https://doi.org/10.1063/5.0143969>
- Kirillov, A., Mintun, E., Ravi, N., Mao, H., Rolland, C., Gustafson, L., Xiao, T., Whitehead, S., Berg, A. C., Lo, W.-Y., Dollár, P., & Girshick, R. (2023). *Segment Anything* (No. arXiv:2304.02643). arXiv. <https://doi.org/10.48550/arXiv.2304.02643>
- Kotaridis, I., & Lazaridou, M. (2021). Remote sensing image segmentation advances: A meta-analysis. *ISPRS Journal of Photogrammetry and Remote Sensing*, 173, 309–322. <https://doi.org/10.1016/j.isprsjprs.2021.01.020>
- Kumar, P., & Kumar, V. (2023). Exploring the Frontier of Object Detection: A Deep Dive into YOLOv8 and the COCO Dataset. *2023 IEEE International Conference on Computer Vision and Machine Intelligence (CVMI)*, 1–6. <https://doi.org/10.1109/CVMI59935.2023.10464837>
- Lazarow, J., Lee, K., Shi, K., & Tu, Z. (2020). *Learning Instance Occlusion for Panoptic Segmentation* (No. arXiv:1906.05896). arXiv. <https://doi.org/10.48550/arXiv.1906.05896>
- Li, J., Huang, X., Tu, L., Lin, Z., Zhang, T., & Wang, L. (2022). A review of building detection from very high resolution optical remote sensing images. *GIScience & Remote Sensing*, 59(1), 1199–1225. <https://doi.org/10.1080/15481603.2022.2101727>
- Li, Q., Mou, L., Sun, Y., Hua, Y., Shi, Y., & Zhu, X. X. (2024). A Review of Building Extraction From Remote Sensing Imagery: Geometrical Structures and Semantic Attributes. *IEEE Transactions on Geoscience and Remote Sensing*, 62, 1–15. <https://doi.org/10.1109/TGRS.2024.3369723>
- Li, R., & Shen, Y. (2023). YOLOSR-IST: A deep learning method for small target detection in infrared remote sensing images based on super-resolution and YOLO. *Signal Processing*, 208, 108962. <https://doi.org/10.1016/j.sigpro.2023.108962>
- Li, S.-Q., & Formisano, A. (2024). Updated empirical vulnerability model considering the seismic damage of typical structures. *Bulletin of Earthquake Engineering*, 22(3), 1147–1185. <https://doi.org/10.1007/s10518-023-01814-8>
- Li, Z., Wegner, J. D., & Lucchi, A. (2019). *Topological Map Extraction from Overhead Images* (No. arXiv:1812.01497). arXiv. <https://doi.org/10.48550/arXiv.1812.01497>
- Lillesand, T., Kiefer, R. W., & Chipman, J. (2015). *Remote Sensing and Image Interpretation*. John Wiley & Sons.

- Lillesand, T. M., Kiefer, R. W., & Chipman, J. W. (2015). *Remote Sensing and Image Interpretation* (7th ed.). Wiley.
- Liu, C., Ge, L., & Bai, T. (2024). Rapid large-scale building damage level classification after earthquakes using deep learning with Lidar and satellite optical data. *International Journal of Digital Earth*, 17(1), 2441934. <https://doi.org/10.1080/17538947.2024.2441934>
- Liu, C., Sepasgozar, S. M. E., Zhang, Q., & Ge, L. (2022). A novel attention-based deep learning method for post-disaster building damage classification. *Expert Systems with Applications*, 202, 117268. <https://doi.org/10.1016/j.eswa.2022.117268>
- Liu, R., Zhu, W., & Yang, X. (2023). Screening Image Features of Collapsed Buildings for Operational and Rapid Remote Sensing Identification. *Remote Sensing*, 15(24), Article 24. <https://doi.org/10.3390/rs15245747>
- Liu, T., Abd-Elrahman, Amr, Morton, Jon, & Wilhelm, V. L. (2018). Comparing fully convolutional networks, random forest, support vector machine, and patch-based deep convolutional neural networks for object-based wetland mapping using images from small unmanned aircraft system. *GIScience & Remote Sensing*, 55(2), 243–264. <https://doi.org/10.1080/15481603.2018.1426091>
- Liu, Y., Ni, C., Wang, P., Yang, D., Yuan, H., & Ma, C. (2025). GU-Net3+: A Global-Local Feature Fusion Algorithm for Building Extraction in Remote Sensing Images. *IEEE Access*, 13, 137724–137741. <https://doi.org/10.1109/ACCESS.2025.3588206>
- Lu, Y., Koperski, K., Kwan, C., & Li, J. (2021). Deep Learning for Effective Refugee Tent Extraction Near Syria–Jordan Border. *IEEE Geoscience and Remote Sensing Letters*, 18(8), 1342–1346. <https://doi.org/10.1109/LGRS.2020.2999354>
- Ma, H., Liu, Y., Ren, Y., Yu, J., Ma, H., Liu, Y., Ren, Y., & Yu, J. (2019). Detection of Collapsed Buildings in Post-Earthquake Remote Sensing Images Based on the Improved YOLOv3. *Remote Sensing*, 12(1). <https://doi.org/10.3390/rs12010044>
- Ma, L., Liu, Y., Zhang, X., Ye, Y., Yin, G., & Johnson, B. A. (2019). Deep learning in remote sensing applications: A meta-analysis and review. *ISPRS Journal of Photogrammetry and Remote Sensing*, 152, 166–177. <https://doi.org/10.1016/j.isprsjprs.2019.04.015>
- Ma, L., Yan, Z., Li, M., Liu, T., Tan, L., Wang, X., He, W., Wang, R., He, G., Lu, H., & Blaschke, T. (2024). Deep Learning Meets Object-Based Image Analysis: Tasks, challenges, strategies, and perspectives. *IEEE Geoscience and Remote Sensing Magazine*, 2–30. <https://doi.org/10.1109/MGRS.2024.3489952>
- Maniyar, C. B., Kumar, M., & Mai, G. (2025). *Feature-Augmented Deep Networks for Multiscale Building Segmentation in High-Resolution UAV and Satellite Imagery* (No. arXiv:2505.05321). arXiv. <https://doi.org/10.48550/arXiv.2505.05321>
- Matin, S. S., & Pradhan, B. (2022). Challenges and limitations of earthquake-induced building damage mapping techniques using remote sensing images-A systematic review. *Geocarto International*. <https://www.tandfonline.com/doi/abs/10.1080/10106049.2021.1933213>
- Maxar Technologies. (2020a). *Maxar Open Data Program: Disaster Response Activation Protocol*. Maxar Technologies. <https://www.maxar.com/open-data>
- Maxar Technologies. (2020b). *WorldView-2 Datasheet* (No. MXR-DS-WV2 06/20). Maxar Technologies. <https://resources.maxar.com/data-sheets/worldview-2>
- May, S., Dupuis, A., Lagrange, A., De Vieilleville, F., & Fernandez-Martin, C. (2022). BUILDING DAMAGE ASSESSMENT WITH DEEP LEARNING. *The International Archives of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, XLIII-B3-2022, 1133–1138. XXIV ISPRS Congress

- “Imaging today, foreseeing tomorrow”, Commission III - 2022 edition, 6–11 June 2022, Nice, France. <https://doi.org/10.5194/isprs-archives-XLIII-B3-2022-1133-2022>
- Mazzanti, P., Scancella, S., Virelli, M., Frittelli, S., Nocente, V., Lombardo, F., Mazzanti, P., Scancella, S., Virelli, M., Frittelli, S., Nocente, V., & Lombardo, F. (2022). Assessing the Performance of Multi-Resolution Satellite SAR Images for Post-Earthquake Damage Detection and Mapping Aimed at Emergency Response Management. *Remote Sensing*, 14(9). <https://doi.org/10.3390/rs14092210>
- McKight, P. E., & Najab, J. (2010). Kruskal-Wallis Test. In *The Corsini Encyclopedia of Psychology* (pp. 1–1). John Wiley & Sons, Ltd. <https://doi.org/10.1002/9780470479216.corpsy0491>
- Melamed, D., Johnson, C., Gerg, I. D., Zhao, C., Blue, R., Hoogs, A., Clipp, B., & Morrone, P. (2024a). Uncovering Bias in Building Damage Assessment from Satellite Imagery. *IGARSS 2024 - 2024 IEEE International Geoscience and Remote Sensing Symposium*, 8095–8099. <https://doi.org/10.1109/IGARSS53475.2024.10642347>
- Melamed, D., Johnson, C., Gerg, I. D., Zhao, C., Blue, R., Hoogs, A., Clipp, B., & Morrone, P. (2024b). Uncovering Bias in Building Damage Assessment from Satellite Imagery. *IGARSS 2024 - 2024 IEEE International Geoscience and Remote Sensing Symposium*, 8095–8099. <https://doi.org/10.1109/IGARSS53475.2024.10642347>
- Melamed, D., Johnson, C., Zhao, C., Blue, R., Morrone, P., Hoogs, A., & Clipp, B. (2023). *xFBD: Focused Building Damage Dataset and Analysis* (No. arXiv:2212.13876). arXiv. <https://doi.org/10.48550/arXiv.2212.13876>
- Montgomery, J., Wartman, J., Reed, A. N., Gallant, A. P., Hutabarat, D., & Mason, H. B. (2021). Field reconnaissance data from GEER investigation of the 2018 MW 7.5 Palu-Donggala earthquake. *Data in Brief*, 34. Scopus. <https://doi.org/10.1016/j.dib.2021.106742>
- Moreno González, C. L., Montoya, G. A., & Lozano Garzón, C. (2025). Toward Reliable Post-Disaster Assessment: Advancing Building Damage Detection Using You Only Look Once Convolutional Neural Network and Satellite Imagery. *Mathematics*, 13(7), Article 7. <https://doi.org/10.3390/math13071041>
- Musthafa, N. F., & Hindaryanto, A. (2021). BANGUNAN TINGGI DAN BENCANA GEMPA BUMI. *Journal of Economic, Business and Engineering (JEBE)*, 3(1), 50–60. <https://doi.org/10.32500/jebe.v3i1.2046>
- Newton, H. J., Cox, N. J., Baum, C. F., Beck, N., Bellocco, R., Kreuter, F., Lachenbruch, P. A., Lauritsen, J., Lemeshow, S., Long, J. S., Newson, R., Nichols, A., Pagano, M., Rabe-Hesketh, S., & Royston, J. P. (2015). The Stata Journal. *Nonparametric Pairwise Multiple Comparisons in Independent Groups Using Dunn’s Test*, 15 Number 1, 292–300.
- Nex, F., Duarte, D., Steenbeek, A., & Kerle, N. (2019). Towards Real-Time Building Damage Mapping with Low-Cost UAV Solutions. *Remote Sensing*, 11(3), Article 3. <https://doi.org/10.3390/rs11030287>
- Nex, F., Duarte, D., Tonolo, F. G., & Kerle, N. (2019a). Structural Building Damage Detection with Deep Learning: Assessment of a State-of-the-Art CNN in Operational Conditions. *Remote Sensing*, 11(23). <https://doi.org/10.3390/rs11232765>
- Nex, F., Duarte, D., Tonolo, F. G., & Kerle, N. (2019b). Structural Building Damage Detection with Deep Learning: Assessment of a State-of-the-Art CNN in Operational Conditions. *Remote Sensing*, 11(23), 2765. <https://doi.org/10.3390/rs11232765>

- Nurkarim, W., & Wijayanto, A. W. (2023). Building footprint extraction and counting on very high-resolution satellite imagery using object detection deep learning framework. *Earth Science Informatics*, 16(1), 515–532. <https://doi.org/10.1007/s12145-022-00895-4>
- Oetjen, J., Sundar, V., Venkatachalam, S., Reicherter, K., Engel, M., Schüttrumpf, H., & Sannasiraj, S. A. (2022). A comprehensive review on structural tsunami countermeasures. *Natural Hazards*, 113(3), 1419–1449. <https://doi.org/10.1007/s11069-022-05367-y>
- Omarzadeh, D., Karimzadeh, S., Matsuoka, M., & Feizizadeh, B. (2021). Earthquake Aftermath from Very High-Resolution WorldView-2 Image and Semi-Automated Object-Based Image Analysis (Case Study: Kermanshah, Sarpol-e Zahab, Iran). *Remote Sensing*, 13(21), 4272. <https://doi.org/10.3390/rs13214272>
- Osco, L. P., Wu, Q., de Lemos, E. L., Gonçalves, W. N., Ramos, A. P. M., Li, J., & Marcato, J. (2023). The Segment Anything Model (SAM) for remote sensing applications: From zero to one shot. *International Journal of Applied Earth Observation and Geoinformation*, 124, 103540. <https://doi.org/10.1016/j.jag.2023.103540>
- Paulik, R., Gusman, A., Williams, J. H., Pratama, G. M., Lin, S., Prawirabhakti, A., Sulendra, K., Zachari, M. Y., Fortuna, Z. E. D., Layuk, N. B. P., & Suwarni, N. W. I. (2019). Tsunami Hazard and Built Environment Damage Observations from Palu City after the September 28 2018 Sulawesi Earthquake and Tsunami. *Pure and Applied Geophysics*, 176(8), 3305–3321. <https://doi.org/10.1007/s00024-019-02254-9>
- Pham, T.-T.-H., Apparicio, P., Gomez, C., Weber, C., & Mathon, D. (2014). Towards a rapid automatic detection of building damage using remote sensing for disaster management: The 2010 Haiti earthquake. *Disaster Prevention and Management: An International Journal*, 23(1), 53–66. Scopus. <https://doi.org/10.1108/DPM-12-2012-0148>
- Qiao, W., Shen, L., Wang, W., & Li, Z. (2024). A Weakly Supervised Bitemporal Scene Change Detection Approach for Pixel-Level Building Damage Assessment Using Pre- and Post-Disaster High-Resolution Remote Sensing Images. *IEEE Transactions on Geoscience and Remote Sensing*, 62, 1–23. <https://doi.org/10.1109/TGRS.2024.3494257>
- Qing, Y., Ming, D., Wen, Q., Weng, Q., Xu, L., Chen, Y., Zhang, Y., & Zeng, B. (2022a). Operational earthquake-induced building damage assessment using CNN-based direct remote sensing change detection on superpixel level. *International Journal of Applied Earth Observation and Geoinformation*, 112, 102899. <https://doi.org/10.1016/j.jag.2022.102899>
- Qing, Y., Ming, D., Wen, Q., Weng, Q., Xu, L., Chen, Y., Zhang, Y., & Zeng, B. (2022b). Operational earthquake-induced building damage assessment using CNN-based direct remote sensing change detection on superpixel level. *International Journal of Applied Earth Observation and Geoinformation*, 112, 102899. <https://doi.org/10.1016/j.jag.2022.102899>
- Rahayu, R. L., S, T. S., & Tambunan, L. (2022). Relationship of Building Form with Damage Pattern and Damage Level. *IOP Conference Series: Earth and Environmental Science*, 1091(1), 012019. <https://doi.org/10.1088/1755-1315/1091/1/012019>
- Rahman, M. R., Kusumawati, R., & Fatimah, F. (2023). Deteksi Objek Menghitung Pohon Kelapa Sawit Menggunakan Metode Deep Learning. *BINA: JURNAL PEMBANGUNAN DAERAH*, 2(1), Article 1. <https://doi.org/10.62389/bina.v2i1.51>

- Rashidian, V., Baise, L. G., Koch, M., & Moaveni, B. (2021). Detecting Demolished Buildings after a Natural Hazard Using High Resolution RGB Satellite Imagery and Modified U-Net Convolutional Neural Networks. *Remote Sensing*, 13(11), 2176. <https://doi.org/10.3390/rs13112176>
- Rastiveis, H., Teymoor Seydi, S., Chen, Z., & Li, J. (2023). Seismic urban damage map generation based on satellite images and Gabor convolutional neural networks. *International Journal of Applied Earth Observation and Geoinformation*, 122, 103450. <https://doi.org/10.1016/j.jag.2023.103450>
- Reddy Parupati, B. C., Kshirsagar, S., Bagai, R., & Dutta, A. (2025). Towards Robust Building Damage Detection: Leveraging Augmentation and Domain Adaptation. *2025 IEEE Green Technologies Conference (GreenTech)*, 163–167. <https://doi.org/10.1109/GreenTech62170.2025.10977720>
- Redmon, J., Divvala, S., Girshick, R., & Farhadi, A. (2016). You Only Look Once: Unified, Real-Time Object Detection. *2016 IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, 779–788. <https://doi.org/10.1109/CVPR.2016.91>
- Robertson, I., Kijewski-Correa, T., Mosalam, K., Prevatt, D., & Roueche, D. (2020). *Field Assessment Structural Team (FAST)* [Dataset]. DesignSafe-CI. <https://doi.org/10.17603/ds2-r40d-m412>
- Rohit, D., Hazarika, H., Maeda, T., Sumartini, W. O., Kokusho, T., Manafi Khajeh Pasha, S., & Nurdin, S. (2021). Forensic investigation of flowslides triggered by the 2018 Sulawesi earthquake. *Progress in Earth and Planetary Science*, 8(1), 60. <https://doi.org/10.1186/s40645-021-00452-5>
- Sakti, A. D., Ihsan, K. T. N., Anggraini, T. S., Shabrina, Z., Sasongko, N. A., Fachrizal, R., Aziz, M., Aryal, J., Yulianto, B., Hadi, P. O., & Wikantika, K. (2022). Multi-Criteria Assessment for City-Wide Rooftop Solar PV Deployment: A Case Study of Bandung, Indonesia. *Remote Sensing*, 14(12), 2796. <https://doi.org/10.3390/rs14122796>
- Samat, A., Gamba, P., Wang, W., Luo, J., Li, E., Liu, S., Du, P., & Abuduwaili, J. (2022). Mapping Blue and Red Color-Coated Steel Sheet Roof Buildings over China Using Sentinel-2A/B MSIL2A Images. *Remote Sensing*, 14(1), 230. <https://doi.org/10.3390/rs14010230>
- Sánchez, A., Alonso, E. M., & Bedolla, J. A. (2020). Point-Load Test Assesment as Study of Adobe Buildings Damaged after the 2017 Puebla Earthquake. *12th International Conference on Structural Analysis of Historical Constructions (SAHC)*. https://www.scipedia.com/public/Sanchez_et_al_2021a
- Sassa, S., & Takagawa, T. (2019). Liquefied gravity flow-induced tsunamis: First evidence and comparison from the 2018 Indonesia Sulawesi earthquake and tsunami disasters. *Landslides*, 16(1), 195–200. <https://doi.org/10.1007/s10346-018-1114-x>
- Schambach, L., Grilli, S. T., & Tappin, D. R. (2021). New High-Resolution Modeling of the 2018 Palu Tsunami, Based on Supershear Earthquake Mechanisms and Mapped Coastal Landslides, Supports a Dual Source. *Frontiers in Earth Science*, 8. <https://doi.org/10.3389/feart.2020.598839>
- Schuegraf, P., Stiller, D., Tian, J., Stark, T., Wurm, M., Taubenböck, H., & Bittner, K. (2024). Ai-Based Building Instance Segmentation in Formal and Informal Settlements. *IGARSS 2024 - 2024 IEEE International Geoscience and Remote Sensing Symposium*, 1558–1561. <https://doi.org/10.1109/IGARSS53475.2024.10642589>
- Sekrecka, A., Kedzierski, M., & Wierzbicki, D. (2019). Pre-Processing of Panchromatic Images to Improve Object Detection in Pansharpened Images. *Sensors*, 19(23), Article 23. <https://doi.org/10.3390/s19235146>

- Setyonegoro, W., Hanif, M., Khoiridah, S., Ramdhan, M., Fauzi, F., Karima, S., Isnaniawardhani, V., Pribadi, S., Muqqodas, M. M., Supendi, P., & Ardhyastuti, S. (2024). Exploring tsunami generation and propagation: A case study of the 2018 Palu earthquake and tsunami. *Kuwait Journal of Science*, 51(3), 100245. <https://doi.org/10.1016/j.kjs.2024.100245>
- Shaloni, Dixit, M., Agarwal, S., & Gupta, P. (2020). Building Extraction from Remote Sensing Images: A Survey. *2020 2nd International Conference on Advances in Computing, Communication Control and Networking (ICACCCN)*, 966–971. <https://doi.org/10.1109/ICACCCN51052.2020.9362894>
- Shastry, A., Carter, E., Coltin, B., Sleeter, R., McMichael, S., & Eggleston, J. (2023). Mapping floods from remote sensing data and quantifying the effects of surface obstruction by clouds and vegetation. *Remote Sensing of Environment*, 291, 113556. <https://doi.org/10.1016/j.rse.2023.113556>
- Shen, Y., Ai, T., Chen, H., & Li, J. (2022). Multilevel Mapping From Remote Sensing Images: A Case Study of Urban Buildings. *IEEE Transactions on Geoscience and Remote Sensing*, 60, 1–16. <https://doi.org/10.1109/TGRS.2021.3062751>
- Shi, L., Zhang, F., Xia, J., Xie, J., Zhang, Z., Du, Z., & Liu, R. (2021). Identifying Damaged Buildings in Aerial Images Using the Object Detection Method. *Remote Sensing*, 13(21), Article 21. <https://doi.org/10.3390/rs13214213>
- Shi, Z., Liang, Z., Yang, Y., & Guo, Y. (2015). Status and prospect of agricultural remote sensing. *Nongye Jixie Xuebao/Transactions of the Chinese Society for Agricultural Machinery*, 46(2), 247–260. Scopus. <https://doi.org/10.6041/j.issn.1000-1298.2015.02.037>
- Shohet, I. M., Aharonson-Daniel, L., Levi, T., Levy, R., Salamon, A., Vilnay, O., Ornai, D., Adini, B., Bar-Dayana, Y., Wei, H.-H., Shapira, S., & Levi, O. (2016). *Analytical-Empirical Model for the Assessment of Earthquake Casualties and Injuries in a Major City in Israel -The Case of Tiberias*. Geological Survey of Israel.
- Shorten, C., & Khoshgoftaar, T. M. (2019). A survey on Image Data Augmentation for Deep Learning. *Journal of Big Data*, 6(1), 60. <https://doi.org/10.1186/s40537-019-0197-0>
- Shrivastava, N., & Rai, P. K. (2015). Automatic building extraction based on multiresolution segmentation using remote sensing data. *Geographia Polonica*. <https://www.geographiapolonica.pl/article/item/10062.html>
- Simanjuntak, P. (2022). *EVALUASI KERUSAKAN BANGUNAN AKIBAT GEMPA DI INDONESIA | Jurnal Rekayasa Teknik Sipil dan Lingkungan—CENTECH*. <https://ejournal.uki.ac.id/index.php/cen/article/view/1425>
- Small, C., Okujeni, A., van der Linden, S., & Waske, B. (2018). 6.07—Remote Sensing of Urban Environments. In S. Liang (Ed.), *Comprehensive Remote Sensing* (pp. 96–127). Elsevier. <https://doi.org/10.1016/B978-0-12-409548-9.10380-X>
- Stow, D. A., Lippitt, C. D., Coulter, L. L., & Davis, B. A. (2015). Time-Sensitive remote sensing systems for post-Hazard damage assessment. In *Time-Sensitive Remote Sensing* (pp. 13–28). Scopus. https://doi.org/10.1007/978-1-4939-2602-2_2
- Sun, C., Chen, H., Du, C., & Jing, N. (2023). SemiBuildingChange: A Semi-Supervised High-Resolution Remote Sensing Image Building Change Detection Method With a Pseudo Bitemporal Data Generator. *IEEE Transactions on Geoscience and Remote Sensing*, 61, 1–19. <https://doi.org/10.1109/TGRS.2023.3321637>
- Swan, B., Laverdiere ,Melanie, Yang ,H. Lexie, & and Rose, A. (2022). Iterative self-organizing SCene-LEvel sampling (ISOSCELES) for large-scale building extraction. *GIScience & Remote Sensing*, 59(1), 1–16. <https://doi.org/10.1080/15481603.2021.2006433>

- Syamsidik, Benazir, Umar, M., Margaglio, G., & Fitrayansyah, A. (2019). Post-tsunami survey of the 28 September 2018 tsunami near Palu Bay in Central Sulawesi, Indonesia: Impacts and challenges to coastal communities. *International Journal of Disaster Risk Reduction*, 38, 101229. <https://doi.org/10.1016/j.ijdrr.2019.101229>
- Syifa, M., Kadavi, P. R., & Lee, C.-W. (2019). An Artificial Intelligence Application for Post-Earthquake Damage Mapping in Palu, Central Sulawesi, Indonesia. *Sensors*, 19(3), Article 3. <https://doi.org/10.3390/s19030542>
- Tarverdiyev, V., Erer, I., Kaplan, N. H., & Musaoğlu, N. (2022). Target Detection in Multispectral Images via Detail Enhanced Pansharpening. *IGARSS 2022 - 2022 IEEE International Geoscience and Remote Sensing Symposium*, 1544–1547. <https://doi.org/10.1109/IGARSS46834.2022.9884355>
- Tatangelo, M., Audisio, L., D’Amato, M., & Gigliotti, R. (2024). Issues related to typological fragility curves derivation starting from observed seismic damage. *Engineering Structures*, 307, 117853. <https://doi.org/10.1016/j.engstruct.2024.117853>
- Thatikonda, M., PK, M. K., & Amsaad, F. (2024). A Novel Dynamic Confidence Threshold Estimation AI Algorithm for Enhanced Object Detection. *NAECON 2024 - IEEE National Aerospace and Electronics Conference*, 359–363. <https://doi.org/10.1109/NAECON61878.2024.10670627>
- Tilon, S., Nex, F., Kerle, N., & Vosselman, G. (2020). Post-Disaster Building Damage Detection from Earth Observation Imagery Using Unsupervised and Transferable Anomaly Detecting Generative Adversarial Networks. *Remote Sensing*, 12(24), Article 24. <https://doi.org/10.3390/rs12244193>
- Tu, J., Sui, H., Feng, W., & Song, Z. (2016). AUTOMATIC BUILDING DAMAGE DETECTION METHOD USING HIGH-RESOLUTION REMOTE SENSING IMAGES AND 3D GIS MODEL. *ISPRS Annals of the Photogrammetry, Remote Sensing and Spatial Information Sciences*, III–8, 43–50. XXIII ISPRS Congress, Commission VIII (Volume III-8) - 12–19 July 2016, Prague, Czech Republic. <https://doi.org/10.5194/isprs-annals-III-8-43-2016>
- UNITAR/UNOSAT. (2018). *Indonesia: Comprehensive Satellite Detected Building Damage Assessment Overview as of 19 October 2018* (No. EQ20181001IDN). United Nations Institute for Training and Research (UNITAR). <https://reliefweb.int/map/indonesia/indonesia-comprehensive-satellite-detected-building-damage-assessment-overview-19>
- Wang, B., Tan, X., Song, D., & Zhang, L. (2020a). Rapid Identification of Post-Earthquake Collapsed Buildings via Multi-Scale Morphological Profiles With Multi-Structuring Elements. *IEEE Access*, 8, 122036–122056. <https://doi.org/10.1109/ACCESS.2020.3007255>
- Wang, B., Tan, X., Song, D., & Zhang, L. (2020b). Rapid Identification of Post-Earthquake Collapsed Buildings via Multi-Scale Morphological Profiles With Multi-Structuring Elements. *IEEE Access*, 8, 122036–122056. <https://doi.org/10.1109/ACCESS.2020.3007255>
- Wang, H., & and Miao, F. (2022). Building extraction from remote sensing images using deep residual U-Net. *European Journal of Remote Sensing*, 55(1), 71–85. <https://doi.org/10.1080/22797254.2021.2018944>
- Wang, L., Wu, J., Yang, Y., Tang, R., & Ya, R. (2024a). Deep Learning Models for Hazard-Damaged Building Detection Using Remote Sensing Datasets: A Comprehensive Review. *IEEE Journal of Selected Topics in Applied Earth Observations and*

- Remote Sensing*, 17, 15301–15318.
<https://doi.org/10.1109/JSTARS.2024.3449097>
- Wang, L., Wu, J., Yang, Y., Tang, R., & Ya, R. (2024b). Deep Learning Models for Hazard-Damaged Building Detection Using Remote Sensing Datasets: A Comprehensive Review. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 17, 15301–15318.
<https://doi.org/10.1109/JSTARS.2024.3449097>
- Wang, Y., Ahsan, U., Li, H., & Hagen, M. (2022). A Comprehensive Review of Modern Object Segmentation Approaches. *Foundations and Trends® in Computer Graphics and Vision*, 13(2–3), 111–283. <https://doi.org/10.1561/06000000097>
- Wang, Y., Chew, A. W. Z., & Zhang, L. (2022). Building damage detection from satellite images after natural disasters on extremely imbalanced datasets. *Automation in Construction*, 140, 104328. <https://doi.org/10.1016/j.autcon.2022.104328>
- Wang, Y., Cui, L., Zhang, C., Chen, W., Xu, Y., & Zhang, Q. (2022). A Two-Stage Seismic Damage Assessment Method for Small, Dense, and Imbalanced Buildings in Remote Sensing Images. *Remote Sensing*, 14(4), Article 4. <https://doi.org/10.3390/rs14041012>
- Wang, Y., Li, Y., & Zhang, S. (2025). Automatic Detection of War-Destroyed Buildings from High-Resolution Remote Sensing Images. *Remote Sensing*, 17(3), Article 3. <https://doi.org/10.3390/rs17030509>
- Wen, Q., Jiang, K., Wang, W., Liu, Q., Guo, Q., Li, L., & Wang, P. (2019). Automatic Building Extraction from Google Earth Images under Complex Backgrounds Based on Deep Instance Segmentation Network. *Sensors*, 19(2), Article 2. <https://doi.org/10.3390/s19020333>
- Wenkel, S., Alhazmi, K., Liiv, T., Alrshoud, S., & Simon, M. (2021). Confidence Score: The Forgotten Dimension of Object Detection Performance Evaluation. *Sensors*, 21(13), 4350. <https://doi.org/10.3390/s21134350>
- Whitworth, M. R. Z., Giardina, G., Penney, C., Di Sarno, L., Adams, K., Kijewski-Correa, T., Black, J., Foroughnia, F., Macchiarulo, V., Milillo, P., Ojaghi, M., Orfeo, A., Pugliese, F., Dönmez, K., Aktas, Y. D., & Macabuag, J. (2022). Lessons for Remote Post-earthquake Reconnaissance from the 14 August 2021 Haiti Earthquake. *Frontiers in Built Environment*, 8. <https://doi.org/10.3389/fbuil.2022.873212>
- Wiguna, S., Adriano, B., Mas, E., & Koshimura, S. (2024a). Evaluation of Deep Learning Models for Building Damage Mapping in Emergency Response Settings. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 17, 5651–5667. <https://doi.org/10.1109/JSTARS.2024.3367853>
- Wiguna, S., Adriano, B., Mas, E., & Koshimura, S. (2024b). Evaluation of Deep Learning Models for Building Damage Mapping in Emergency Response Settings. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 17, 5651–5667. <https://doi.org/10.1109/JSTARS.2024.3367853>
- Wu, C., Zhang, F., Xia, J., Xu, Y., Li, G., Xie, J., Du, Z., & Liu, R. (2021). Building Damage Detection Using U-Net with Attention Mechanism from Pre- and Post-Disaster Remote Sensing Datasets. *Remote Sensing*, 13(5), 905. <https://doi.org/10.3390/rs13050905>
- Wu, T., & Dong, Y. (2023). YOLO-SE: Improved YOLOv8 for Remote Sensing Object Detection and Recognition. *Applied Sciences*, 13(24), Article 24. <https://doi.org/10.3390/app132412977>
- Wu, W., Liu, H., Li, L., Long, Y., Wang, X., Wang, Z., Li, J., & Chang, Y. (2021). Application of local fully Convolutional Neural Network combined with YOLO

- v5 algorithm in small target detection of remote sensing image. *PLOS ONE*, 16(10), e0259283. <https://doi.org/10.1371/journal.pone.0259283>
- Wurm, M., Schmitt, A., & Taubenbock, H. (2016). Building Types' Classification Using Shape-Based Features and Linear Discriminant Functions. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 9(5), 1901–1912. <https://doi.org/10.1109/JSTARS.2015.2465131>
- Xian, W. (2023). *Construction of Urban Planning Model Based on Remote Sensing Image Data Processing Algorithm*. 367–371. Scopus. <https://doi.org/10.1109/ICDIIME59043.2023.00077>
- Xiao, C., Wu, Z., Ma, G., Kong, S., Li, T., & Lu, Y. (2023). An Orthographic Mean-Shift Clustering and Segmentation Method for Building Mask Regularization. *IGARSS 2023 - 2023 IEEE International Geoscience and Remote Sensing Symposium*, 6608–6611. <https://doi.org/10.1109/IGARSS52108.2023.10282335>
- Xiao, Y., & Mostafavi, A. (2025). DamageCAT: A deep learning transformer framework for typology-based post-disaster building damage categorization. *International Journal of Disaster Risk Reduction*, 128, 105704. <https://doi.org/10.1016/j.ijdr.2025.105704>
- Xie, Y., Feng, D., Chen, H., Liu, Z., Mao, W., Zhu, J., Hu, Y., & Baik, S. W. (2022). Damaged Building Detection From Post-Earthquake Remote Sensing Imagery Considering Heterogeneity Characteristics. *IEEE Transactions on Geoscience and Remote Sensing*, 60, 1–17. <https://doi.org/10.1109/TGRS.2022.3200872>
- Xie, Z., Zhou, Z., He, X., Fu, Y., Gu, J., & Zhang, J. (2024). Methodology for Object-Level Change Detection in Post-Earthquake Building Damage Assessment Based on Remote Sensing Images: OCD-BDA. *Remote Sensing*, 16(22), Article 22. <https://doi.org/10.3390/rs16224263>
- Xu, Y., & Goodacre, R. (2018). On Splitting Training and Validation Set: A Comparative Study of Cross-Validation, Bootstrap and Systematic Sampling for Estimating the Generalization Performance of Supervised Learning. *Journal of Analysis and Testing*, 2(3), 249–262. <https://doi.org/10.1007/s41664-018-0068-2>
- Xu, Y., Wu, L., Xie, Z., & Chen, Z. (2018). Building Extraction in Very High Resolution Remote Sensing Imagery Using Deep Learning and Guided Filters. *Remote Sensing*, 10(1), 144. <https://doi.org/10.3390/rs10010144>
- xView2. (2020). *xView2: Building Damage Assessment Challenge*. xView2. <https://xview2.org/dataset>
- Yan, G., Jing, H., Li, H., Guo, H., & He, S. (2023). Enhancing Building Segmentation in Remote Sensing Images: Advanced Multi-Scale Boundary Refinement with MBR-HRNet. *Remote Sensing*, 15(15), 3766. <https://doi.org/10.3390/rs15153766>
- Yan, Z., Huazhong, R., & Danyang, G. (2020a). Research on the Detection Method of Building Seismic Damage Change. *IGARSS 2020 - 2020 IEEE International Geoscience and Remote Sensing Symposium*, 2906–2908. <https://doi.org/10.1109/IGARSS39084.2020.9323872>
- Yan, Z., Huazhong, R., & Danyang, G. (2020b). *Research on the Detection Method of Building Seismic Damage Change*. 2906–2908. Scopus. <https://doi.org/10.1109/IGARSS39084.2020.9323872>
- Yang, S., Xiao, W., Zhang, M., Guo, S., Zhao, J., & Shen, F. (2023). *Image Data Augmentation for Deep Learning: A Survey* (No. arXiv:2204.08610). arXiv. <https://doi.org/10.48550/arXiv.2204.08610>
- Yang, W., Zhang, X., & Luo, P. (2021). Transferability of Convolutional Neural Network Models for Identifying Damaged Buildings Due to Earthquake. *Remote Sensing*, 13(3), 504. <https://doi.org/10.3390/rs13030504>

- Yu, K., Wang, S., Wang, Y., Gu, Z., & Wang, Y. (2025). DBA-RTMDet: A High-Precision and Real-Time Instance Segmentation Method for Identification of Damaged Buildings in Postearthquake UAV Imagery. *IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing*, 18, 19577–19593. <https://doi.org/10.1109/JSTARS.2025.3568876>
- Yu, Y., Wang, C., Gu, X., & Li, J. (2019). A novel deep learning-based method for damage identification of smart building structures. *Structural Health Monitoring*, 18(1), 143–163. <https://doi.org/10.1177/1475921718804132>
- Zealandia, S. N. F., Puteri, S. H., Umarhadi, D. A., Dharmawan, R. D., & Farda, N. M. (2019). GIS application for damaged buildings assessment and shelter distribution analysis after earthquake and tsunami in Palu 2018. *Sixth Geoinformation Science Symposium, 11311*, 130–135. <https://doi.org/10.1117/12.2548660>
- Zhan, Y., Liu, W., & Maruyama, Y. (2022a). Damaged Building Extraction Using Modified Mask R-CNN Model Using Post-Event Aerial Images of the 2016 Kumamoto Earthquake. *Remote Sensing*, 14(4), Article 4. <https://doi.org/10.3390/rs14041002>
- Zhan, Y., Liu, W., & Maruyama, Y. (2022b). Damaged Building Extraction Using Modified Mask R-CNN Model Using Post-Event Aerial Images of the 2016 Kumamoto Earthquake. *Remote Sensing*, 14(4), Article 4. <https://doi.org/10.3390/rs14041002>
- Zhang, C., Li, Z., Li, P., Yang, J., & Zhu, D. (2015). Urban-rural land use plan monitoring based on high spatial resolution remote sensing imagery classification. *Nongye Jixie Xuebao/Transactions of the Chinese Society for Agricultural Machinery*, 46(11), 323–329. Scopus. <https://doi.org/10.6041/j.issn.1000-1298.2015.11.044>
- Zhang, H., Jiang, Z., Zheng, G., & Yao, X. (2023). Semantic Segmentation of High-Resolution Remote Sensing Images with Improved U-Net Based on Transfer Learning. *International Journal of Computational Intelligence Systems*, 16(1), 181. <https://doi.org/10.1007/s44196-023-00364-w>
- Zhang, Y., Ye, M., Zhu, G., Liu, Y., Guo, P., & Yan, J. (2024). FFCA-YOLO for Small Object Detection in Remote Sensing Images. *IEEE Transactions on Geoscience and Remote Sensing*, 62, 1–15. <https://doi.org/10.1109/TGRS.2024.3363057>
- Zhao, Z., Wang, F., Chen, S., Wang, H., & Cheng, G. (2024). Deep object segmentation and classification networks for building damage detection using the xBD dataset. *International Journal of Digital Earth*, 17(1), 2302577. <https://doi.org/10.1080/17538947.2024.2302577>
- Zhao, Z., Wang ,Fenglei, Chen ,Shiyu, Wang ,Hongtao, & and Cheng, G. (2024). Deep object segmentation and classification networks for building damage detection using the xBD dataset. *International Journal of Digital Earth*, 17(1), 2302577. <https://doi.org/10.1080/17538947.2024.2302577>
- Zheng, Z., Ma, P., & Wu, Z. (2024). A context-structural feature decoupling change detection network for detecting earthquake-triggered damage. *International Journal of Applied Earth Observation and Geoinformation*, 131, 103961. <https://doi.org/10.1016/j.jag.2024.103961>
- Zhou, Y. (2024). A YOLO-NL object detector for real-time detection. *Expert Systems with Applications*, 238, 122256. <https://doi.org/10.1016/j.eswa.2023.122256>
- Zou, R., Liu, J., Pan, H., Tang, D., & Zhou, R. (2024a). An Improved Instance Segmentation Method for Fast Assessment of Damaged Buildings Based on Post-Earthquake UAV Images. *Sensors*, 24(13), Article 13. <https://doi.org/10.3390/s24134371>
- Zou, R., Liu, J., Pan, H., Tang, D., & Zhou, R. (2024b). An Improved Instance Segmentation Method for Fast Assessment of Damaged Buildings Based on Post-

Earthquake UAV Images. *Sensors*, 24(13), Article 13.
<https://doi.org/10.3390/s24134371>