

REFERENCES

- [1] Y. Park, Y. Kim, A. H. Baluch, and C. G. Kim, ‘Empirical study of the high velocity impact energy absorption characteristics of shear thickening fluid (STF) impregnated Kevlar fabric’, *Int. J. Impact Eng.*, vol. 72, pp. 67–74, 2014, doi: 10.1016/j.ijimpeng.2014.05.007.
- [2] A. Sharma, R. Mishra, S. Jain, S. S. Padhee, and P. K. Agnihotri, ‘Deformation behavior of single and multi-layered materials under impact loading’, *Thin-Walled Struct.*, vol. 126, no. August, pp. 193–204, 2018, doi: 10.1016/j.tws.2017.08.021.
- [3] H. A. Bruck, ‘One-dimensional model for designing functionally graded materials to manage stress waves’, *Int. J. Solids Struct.*, vol. 37, no. 44, pp. 6383–6395, 2000, doi: 10.1016/S0020-7683(99)00236-X.
- [4] R. Sriram, U. K. Vaidya, and J. E. Kim, ‘Blast impact response of aluminum foam sandwich composites’, *J. Mater. Sci.*, vol. 41, no. 13, pp. 4023–4039, 2006, doi: 10.1007/s10853-006-7606-4.
- [5] C. Yin, Z. Jin, Y. Chen, and H. Hua, ‘Shock mitigation effects of cellular cladding on submersible hull subjected to deep underwater explosion’, *Ocean Eng.*, vol. 117, pp. 221–237, 2016, doi: 10.1016/j.oceaneng.2016.03.037.
- [6] A. Remennikov, T. Ngo, D. Mohotti, B. Uy, and M. Netherton, ‘Experimental investigation and simplified modeling of response of steel plates subjected to close-in blast loading from spherical liquid explosive charges’, *Int. J. Impact Eng.*, vol. 101, pp. 78–89, 2017, doi: 10.1016/j.ijimpeng.2016.11.013.
- [7] G. Imbalzano, P. Tran, T. D. Ngo, and P. V. S. Lee, ‘A numerical study of auxetic composite panels under blast loadings’, *Compos. Struct.*, vol. 135, no. September, pp. 339–352, 2016, doi: 10.1016/j.compstruct.2015.09.038.
- [8] B. A. Gama *et al.*, ‘Aluminum foam integral armor: A new dimension in armor design’, *Compos. Struct.*, vol. 52, no. 3–4, pp. 381–395, 2001, doi: 10.1016/S0263-8223(01)00029-0.
- [9] S. Patil, D. M. Reddy, and M. Reddy, ‘Low velocity impact analysis on composite structures - A review’, *AIP Conf. Proc.*, vol. 1943, no. October, 2018, doi: 10.1063/1.5029585.
- [10] M. Sadighi, R. C. Alderliesten, and R. Benedictus, ‘Impact resistance of fiber-metal laminates: A review’, *Int. J. Impact Eng.*, vol. 49, pp. 77–90, 2012, doi: 10.1016/j.ijimpeng.2012.05.006.
- [11] A. P. Garshin, V. I. Kulik, and A. S. Nilov, ‘Shock-Resistant Materials Based on Commercial Grade Ceramic: Achievements and Prospects for Improving Their Ballistic Efficiency’, *Refract. Ind. Ceram.*, vol. 57, no. 2, pp. 207–219, 2016, doi: 10.1007/s11148-016-9955-0.
- [12] J. W. Tedesco and D. W. Landis, ‘Wave Propagation Through Layered System’,

Comput. Struct., 32, pp. 625–638, 1989.

- [13] P. J. Hazell, ‘Armour: Materials, Theory and Design’, *CRC Press/Taylor & Francis, Boca Raton, FL*. ISBN: 9781482238303, 2015.
- [14] M. Hokka, ‘Dynamic Behavior of Materials’, *Dyn. Behav. Mater. Fundam. Mater. Model. Microstruct. Eff.*, pp. 1–693, 2023, doi: 10.1016/C2021-0-00230-3.
- [15] P. L. N. Fernando, D. Mohotti, and A. Remennikov, ‘An innovative approach of using continuous impedance-graded metallic composite system for attenuation of stress waves’, *J. Appl. Mech. Trans. ASME*, vol. 86, no. 6, 2019, doi: 10.1115/1.4042681.
- [16] P. L. N. Fernando, ‘Design of an Impedance-Graded Metallic Composite System as a Protective Mechanism for Concrete Structures’, vol. 86, no. September, pp. 1–6, 2019, doi: 10.1115/1.4043886.
- [17] P. L. N. Fernando, D. Mohotti, and A. Remennikov, ‘Behaviour of explosively welded impedance-graded multi-metal composite plates under near-field blast loads’, *Int. J. Mech. Sci.*, vol. 163, no. May, p. 105124, 2019, doi: 10.1016/j.ijmecsci.2019.105124.
- [18] P. Ranaweera, D. Weerasinghe, P. L. N. Fernando, S. N. Raman, and D. Mohotti, ‘Ballistic performance of multi-metal systems’, *Int. J. Prot. Struct.*, vol. 11, no. 3, pp. 379–410, 2020, doi: 10.1177/2041419619898693.
- [19] J. E. Field, S. M. Walley, W. G. Proud, H. T. Goldrein, and C. R. Siviour, *Review of experimental techniques for high rate deformation and shock studies*, vol. 30, no. 7. 2004. doi: 10.1016/j.ijimpeng.2004.03.005.
- [20] P. L. N. Fernando, D. Mohotti, A. Remennikov, P. J. Hazell, H. Wang, and A. Amin, ‘Experimental, numerical and analytical study on the shock wave propagation through impedance-graded multi-metallic systems’, *Int. J. Mech. Sci.*, vol. 178, no. March, p. 105621, 2020, doi: 10.1016/j.ijmecsci.2020.105621.
- [21] J. H. Garrett, ‘Neural networks and their applicability within civil engineering’, *Computing in Civil Engineering and Geographic Information Systems Symposium*. ASCE; 1992. p. 1155–62.
- [22] S. M. Lundberg and S. I. Lee, ‘A unified approach to interpreting model predictions’, *Adv. Neural Inf. Process. Syst.*, vol. 2017-Decem, no. December, pp. 4766–4775, 2017, doi: 10.48550/arXiv.1705.07874.
- [23] P. L. N. Fernando, D. Mohotti, A. Remennikov, P. J. Hazell, H. Wang, and A. Amin, ‘Stress propagation and debonding effects in impedance-graded multi-metallic systems under impact loading’, *Int. J. Prot. Struct.*, vol. 12, no. 1, pp. 3–21, 2021, doi: 10.1177/2041419620917709.
- [24] A. Alavi Nia and G. R. Hoseini, ‘Experimental study of perforation of multi-layered targets by hemispherical-nosed projectiles’, *Mater. Des.*, vol. 32, no. 2,

pp. 1057–1065, 2011, doi: 10.1016/j.matdes.2010.07.001.

- [25] H. Babaei, T. Mirzababaie Mostofi, and M. Alitavoli, ‘Experimental and analytical investigation into large ductile transverse deformation of monolithic and multi-layered metallic square targets struck normally by rigid spherical projectile’, *Thin-Walled Struct.*, vol. 107, pp. 257–265, 2016, doi: 10.1016/j.tws.2016.06.013.
- [26] L. Davison, *Fundamentals of shock wave propagation in solids*. Springer, Berlin, 2008. doi: 10.1007/978-3-540-74569-3.
- [27] D. Grady, *Shocks and structured waves*. 2017. doi: 10.1088/978-0-7503-1254-7ch1.
- [28] S. Shah, P. J. Hazell, H. Wang, and J. P. Escobedo, *Shock Wave Mitigation in Heterogeneous Systems: A Review*, no. 0123456789. Springer International Publishing, 2025. doi: 10.1007/s40870-025-00466-w.
- [29] R. A. Graham, *Measurement of wave profiles in shock loaded solids*. Springer US: Boston, pp. 1886–1901, 1979. doi: 10.1007/978-1-4684-7470-1_229.
- [30] J. C. Peck and G. A. Gurtman, ‘Dispersive pulse propagation parallel to the interfaces of a laminated composite’, *J. Appl. Mech. Trans. ASME*, vol. 36, no. 3, pp. 479–484, 1964, doi: 10.1115/1.3564704.
- [31] G. I. Kanel, V. E. Fortov, and S. V. Razorenov, ‘Shock waves in condensed-state physics’, vol. 771, 2007, doi: 10.1070/PU2007v050n08ABEH006327.
- [32] P. E. Specht, N. N. Thadhani, and T. P. Weihs, ‘Configurational effects on shock wave propagation in Ni-Al multilayer composites’, *J. Appl. Phys.*, vol. 111, no. 7, 2012, doi: 10.1063/1.3702867.
- [33] M. K. Almustafa and M. L. Nehdi, ‘Machine learning model for predicting structural response of RC slabs exposed to blast loading’, *Eng. Struct.*, vol. 221, no. June, p. 111109, 2020, doi: 10.1016/j.engstruct.2020.111109.
- [34] D. K. Thai, T. M. Tu, T. Q. Bui, and T. T. Bui, ‘Gradient tree boosting machine learning on predicting the failure modes of the RC panels under impact loads’, *Eng. Comput.*, vol. 37, no. 1, pp. 597–608, 2021, doi: 10.1007/s00366-019-00842-w.
- [35] F. Emami and M. Z. Kabir, ‘Strength prediction of composite metal deck slabs under free drop weight impact loading using numerical approach and data set machine learning’, *Sci. Iran.*, vol. 0, no. 0, pp. 0–0, 2023, doi: 10.24200/sci.2023.59582.6321.
- [36] G. Chen, T. Li, Q. Chen, S. Ren, C. Wang, and S. Li, ‘Application of deep learning neural network to identify collision load conditions based on permanent plastic deformation of shell structures’, *Comput. Mech.*, vol. 64, no. 2, pp. 435–449, 2019, doi: 10.1007/s00466-019-01706-2.
- [37] M. Zhang, D. Drikakis, L. Li, and X. Yan, ‘Machine-learning prediction of

- underwater shock loading on structures’, *Computation*, vol. 7, no. 4, pp. 1–11, 2019, doi: 10.3390/COMPUTATION7040058.
- [38] A. E. Mayer, M. V. Lekanov, N. A. Grachyova, and E. V. Fomin, ‘Machine-Learning-Based Model of Elastic—Plastic Deformation of Copper for Application to Shock Wave Problem’, *Metals (Basel)*, vol. 12, no. 3, 2022, doi: 10.3390/met12030402.
 - [39] M. T. Ribeiro, S. Singh, and C. Guestrin, “‘Why should i trust you?’ Explaining the predictions of any classifier’, *Proc. ACM SIGKDD Int. Conf. Knowl. Discov. Data Min.*, vol. 13-17-Aug, pp. 1135–1144, 2016, doi: 10.1145/2939672.2939778.
 - [40] D. Lai, C. Demartino, and Y. Xiao, ‘Interpretable machine-learning models for maximum displacements of RC beams under impact loading predictions’, *Eng. Struct.*, vol. 281, no. March, 2023, doi: 10.1016/j.engstruct.2023.115723.
 - [41] A. Husnain, M. Iqbal, H. A. Waqas, M. El-Meligy, M. F. Javed, and R. Ullah, ‘Machine learning techniques for predicting the peak response of reinforced concrete beam subjected to impact loading’, *Results Eng.*, vol. 24, no. June, p. 103135, 2024, doi: 10.1016/j.rineng.2024.103135.
 - [42] C. Widanage, D. Mohotti, C. K. Lee, K. Wijesooriya, and D. P. P. Meddage, ‘Use of explainable machine learning models in blast load prediction’, *Eng. Struct.*, vol. 312, no. May, p. 118271, 2024, doi: 10.1016/j.engstruct.2024.118271.
 - [43] D. P. P. Meddage *et al.*, ‘Explainable Machine Learning (XML) to predict external wind pressure of a low-rise building in urban-like settings’, *J. Wind Eng. Ind. Aerodyn.*, vol. 226, no. December 2021, p. 105027, 2022, doi: 10.1016/j.jweia.2022.105027.
 - [44] P. Thisovithan, H. Aththanayake, D. P. P. Meddage, I. U. Ekanayake, and U. Rathnayake, ‘A novel explainable AI-based approach to estimate the natural period of vibration of masonry infill reinforced concrete frame structures using different machine learning techniques’, *Results in Engineering*, vol. 19, 2023. doi: 10.1016/j.rineng.2023.101388.
 - [45] D. P. P. Meddage, I. Fonseka, D. Mohotti, K. Wijesooriya, and C. K. Lee, ‘An explainable machine learning approach to predict the compressive strength of graphene oxide-based concrete’, *Constr. Build. Mater.*, vol. 449, no. August, p. 138346, 2024, doi: 10.1016/j.conbuildmat.2024.138346.
 - [46] P. Cooper, ‘Explosives Engineering’, p. 480, 1996.
 - [47] E. Kelderman, ‘Mechanical behaviour of armoured steel under high strain rate tensile loading conditions’, In: The UNSW Canberra at ADFA journal of undergraduate engineering research; 2015. p. 8.
 - [48] A. E. Buzyurkin, I. L. Gladky, and E. I. Kraus, ‘Determination and verification of Johnson–Cook model parameters at high-speed deformation of titanium alloys’, *Aerosp SciTechnol* 2015; 45:121–7, doi: 10.1016/j.ast.2015.05.001.

- [49] K. C. Jørgensen and V. Swan, ‘Modeling of Armour-piercing Projectile Perforation of Thick Aluminium Plates’, *13th Int. LS-DYNA Users Conf.*, pp. 1–15, 2014.
- [50] Y. Wang, M. Qi, H. He, and L. Wang, ‘Spall failure of aluminum materials with different microstructures’, *Mech. Mater.*, vol. 69, no. 1, pp. 270–279, 2014, doi: 10.1016/j.mechmat.2013.11.005.
- [51] T. Hastie, R. Tibshirani, and J. Friedman, *The Elements of Statistical Learning: Data Mining, Inference, and Prediction*, 2nd ed. Springer: New York, NY, USA, 2009.
- [52] H. H. Patel and P. Prajapati, ‘Study and analysis of decision tree based classification algorithms’, *Int. J. Comput. Sci. Eng.*, vol. 6, no. 10, pp. 74–78, 2018, doi: 10.26438/ijcse/v6i10.7478.
- [53] S. Singh, ‘Comparative Study Id3 , Cart and C4 . 5 Decision Tree Algorithm : a Survey’, *Int. J. Adv. Inf. Sci. Technol.*, vol. 27, no. 27, pp. 97–103, 2014, doi: 10.15693/ijaist/2014.v3i7.47-52.
- [54] V. Rodriguez-Galiano, M. Sanchez-Castillo, M. Chica-Olmo, and M. Chica-Rivas, ‘Machine learning predictive models for mineral prospectivity: An evaluation of neural networks, random forest, regression trees and support vector machines’, *Ore Geol. Rev.*, vol. 71, pp. 804–818, 2015, doi: 10.1016/j.oregeorev.2015.01.001.
- [55] R. K. Zimmerman *et al.*, ‘Classification and Regression Tree (CART) analysis to predict influenza in primary care patients’, *BMC Infect. Dis.*, vol. 16, no. 1, pp. 1–11, 2016, doi: 10.1186/s12879-016-1839-x.
- [56] Z. Jin, J. Shang, Q. Zhu, C. Ling, W. Xie, and B. Qiang, ‘RFRSF: Employee Turnover Prediction Based on Random Forests and Survival Analysis’, *Lect. Notes Comput. Sci. (including Subser. Lect. Notes Artif. Intell. Lect. Notes Bioinformatics)*, vol. 12343 LNCS, pp. 503–515, 2020, doi: 10.1007/978-3-030-62008-0_35.
- [57] R. Richman and M. V. Wüthrich, ‘Bagging predictors’, *Risks*, vol. 8, no. 3, pp. 1–26, 2020, doi: 10.3390/risks8030083.
- [58] B. Efron and R. J. Tibshirani, ‘An Introduction to the Bootstrap’. CRC press, 1994.
- [59] S. Han and H. Kim, ‘On the optimal size of candidate feature set in random forest’, *Appl. Sci.*, vol. 9, no. 5, 2019, doi: 10.3390/app9050898.
- [60] A. Choudhury and D. Gupta, *A Survey on Medical Diagnosis of Diabetes Using Machine Learning Techniques*, vol. 740. Springer Singapore, 2019. doi: 10.1007/978-981-13-1280-9_6.
- [61] S. Marsland, ‘Esmeble Method Foundation’. pp. 1–232, 2011.
- [62] T. Chen and C. Guestrin, ‘XGBoost: A scalable tree boosting system’, *Proc.*

ACM SIGKDD Int. Conf. Knowl. Discov. Data Min., vol. 13-17-Aug, pp. 785–794, 2016, doi: 10.1145/2939672.2939785.

- [63] J. H. Friedman, ‘Stochastic gradient boosting’, *Comput. Stat. Data Anal.*, vol. 38, no. 4, pp. 367–378, 2002, doi: 10.1016/S0167-9473(01)00065-2.
- [64] M. Z. Naser, ‘An engineer’s guide to eXplainable Artificial Intelligence and Interpretable Machine Learning: Navigating causality, forced goodness, and the false perception of inference’, *Autom. Constr.*, vol. 129, no. April, p. 103821, 2021, doi: 10.1016/j.autcon.2021.103821.
- [65] T. Miller, ‘Explanation in artificial intelligence: Insights from the social sciences’, *Artif. Intell.*, vol. 267, pp. 1–38, 2019, doi: 10.1016/j.artint.2018.07.007.
- [66] A. Gottard, G. Vannucci, and G. M. Marchetti, ‘A note on the interpretation of tree-based regression models’, *Biometrical J.*, vol. 62, no. 6, pp. 1564–1573, 2020, doi: 10.1002/bimj.201900195.
- [67] F. Pedregosa, et al., ‘Scikit-learn: Machine learning in Python’, *J. Mach. Learn. Res.* vol. 12 (2011) 2825–2830.
- [68] M. T. Ribeiro and C. Guestrin, ‘Anchors : High-Precision Model-Agnostic Explanations’, pp. 1527–1535.
- [69] C. Molnar, ‘Interpretable Machine Learning. A Guide for Making Black Box Models Explainable.’, *Book*, p. 247, 2020, [Online]. Available: <https://christophm.github.io/interpretable-ml-book>
- [70] M. Moradi and M. Samwald, ‘Post-hoc explanation of black-box classifiers using confident itemsets’, *Expert Syst. Appl.*, vol. 165, no. March, 2021, doi: 10.1016/j.eswa.2020.113941.
- [71] C. Molnar, G. Casalicchio, and B. Bischl, ‘Interpretable Machine Learning – A Brief History, State-of-the-Art and Challenges’, *Commun. Comput. Inf. Sci.*, vol. 1323, no. January, pp. 417–431, 2020, doi: 10.1007/978-3-030-65965-3_28.
- [72] Y. Liang, S. Li, C. Yan, M. Li, and C. Jiang, ‘Explaining the black-box model: A survey of local interpretation methods for deep neural networks’, *Neurocomputing*, vol. 419, pp. 168–182, 2021, doi: 10.1016/j.neucom.2020.08.011.
- [73] D. P. P. Meddage, D. Mohotti, and K. Wijesooriya, ‘Predicting transient wind loads on tall buildings in three-dimensional spatial coordinates using machine learning’, *J. Build. Eng.*, vol. 85, no. October 2023, p. 108725, 2024, doi: 10.1016/j.jobbe.2024.108725.
- [74] J. Franklin, ‘The elements of statistical learning: data mining, inference and prediction’, *Math. Intell.*, vol. 27, no. 2, pp. 83–85, 2005, doi: 10.1007/BF02985802.

- [75] A. Botchkarev, ‘Evaluating Performance of Regression Machine Learning Models Using Multiple Error Metrics in Azure Machine Learning Studio’, *SSRN Electron. J.*, no. March, 2018, doi: 10.2139/ssrn.3177507.
- [76] W. K. V. J. B. Kulasooriya, R. S. S. Ranasinghe, U. S. Perera, P. Thisovithan, I. U. Ekanayake, and D. P. P. Meddage, ‘Modeling strength characteristics of basalt fiber reinforced concrete using multiple explainable machine learning with a graphical user interface’, *Sci. Rep.*, vol. 13, no. 1, pp. 1–16, 2023, doi: 10.1038/s41598-023-40513-x.
- [77] M. B. Rauls and G. Ravichandran, ‘Structure of shock waves in particulate composites’, *J. Appl. Phys.*, vol. 127, no. 6, 2020, doi: 10.1063/1.5125449.
- [78] M. A. Meyers and C. Taylor Aimone, ‘Dynamic fracture (spalling) of metals’, *Prog. Mater. Sci.*, vol. 28, no. 1, pp. 1–96, 1983, doi: 10.1016/0079-6425(83)90003-8.