REFERENCES

[1] Z. Roozbahani, B. Minaei, R. Qiasi, Z. Roozbehani, and B. Minaei-Bidgoli, "Predict Customer Churn By Using Rough Set Theory and Neural Network," no. January, 2013, [Online]. Available: https://www.researchgate.net/publication/308399969.

[2] J. T. Bowen and S. Chen, "The relationship between customer loyalty and customer satisfaction," pp. 213–217, 1999.

[3] H. Abbasimehr, M. Setak, and M. J. Tarokh, "A neuro-fuzzy classifier for customer churn prediction," *Int. J. Comput. Appl.*, vol. 19, no. 8, pp. 35–41, 2011.

[4] J. Frempong, "Importance of Education in Human Life: A Holistic Approach," pp. 23–28.

[5] S. Altenhofen, M. Berends, and T. G. White, "School Choice Decision Making Among Suburban , High-Income Parents," vol. 2, no. 1, pp. 1–14, 2016, doi: 10.1177/2332858415624098.

[6] N. Alyani, M. Mohamed, and S. Bachok, "An assessment of factors influencing parents ' decision making when choosing a private school for their children : a case study of Selangor , Malaysia : for sustainable human capital," *Procedia Environ. Sci.*, vol. 28, no. SustaiN 2014, pp. 406–417, 2015, doi: 10.1016/j.proenv.2015.07.050.

[7] D. Sansone, "Beyond Early Warning Indicators: High School Dropout and Machine Learning," *Oxf. Bull. Econ. Stat.*, vol. 81, no. 2, pp. 456–485, 2019, doi: 10.1111/obes.12277.

[8] J. Y. Chung and S. Lee, "Dropout early warning systems for high school students using machine learning," *Child. Youth Serv. Rev.*, p. #pagerange#, 2018, doi: 10.1016/j.childyouth.2018.11.030.

[9] M. M. Hassan, "Prediction of School Drop outs with the help of Machine Learning Algorithms," no. July, 2020.

[10] S. Lee and J. Y. Chung, "The machine learning-based dropout early warning system for improving the performance of dropout prediction," *Appl. Sci.*, vol. 9, no. 15, 2019, doi: 10.3390/app9153093.

[11] R. S. Baker, A. W. Berning, S. M. Gowda, S. Zhang, and A. Hawn, "Predicting K-12 Dropout," *J. Educ. Students Placed Risk*, vol. 25, no. 1, pp. 28–54, 2020, doi: 10.1080/10824669.2019.1670065.

[12] G. Wanganga and Y. Qu, "A Deep Learning based Customer Sentiment Analysis Model to Enhance Customer Retention and Loyalty in the Payment Industry," in *Proceedings - 2020 International Conference on Computational Science and Computational Intelligence, CSCI 2020*, 2020, pp. 473–478, doi: 10.1109/CSCI51800.2020.00086.

[13] B. Almohaimmeed, "Pillars of customer retention: An empirical study on the influence of customer satisfaction, customer loyalty, customer profitability on customer retention," *Serbian J. Manag.*, vol. 14, no. 2, pp. 421–435, 2019, doi: 10.5937/sjm14-15517.

[14] W. Verbeke, D. Martens, C. Mues, and B. Baesens, "Building comprehensible customer churn prediction models with advanced rule

induction techniques," *Expert Syst. Appl.*, vol. 38, no. 3, pp. 2354–2364, 2010, doi: 10.1016/j.eswa.2010.08.023.
[15] T. Vafeiadis, K. I. Diamantaras, G. Sarigiannidis, and K. C. Chatzisavvas, "A comparison of machine learning techniques for customer churn prediction," *Simul. Model. Pract. Theory*, vol. 55, pp. 1–9, 2015, doi: 10.1016/j.simpat.2015.03.003.
[16] G. Kraljevíc and S. Gotovac, "Modeling data mining applications for prediction of prepaid churn in telecommunication services," *Automatika*, vol. 51, no. 3, pp. 275–283, 2010, doi: 10.1080/00051144.2010.11828381.
[17] A. Ghorbani and F. Taghiyareh, "CMF: A Framework to Improve the Management of Customer Churn," *2009 IEEE Asia-Pacific Serv. Comput. Conf.*, no. 1, pp. 457–462, 2009, doi: 10.1109/APSCC.2009.5394085.
[18] C. Tsai and Y. Lu, "Customer churn prediction by hybrid neural networks," *Expert Syst. Appl.*, vol. 36, no. 10, pp. 12547–12553, 2009, doi: 10.1016/j.eswa.2009.05.032.
[19] Y. Xie, X. Li, E. W. T. Ngai, and W. Ying, "Customer churn prediction using improved balanced random forests," *Expert Syst. Appl.*, vol. 36, no. 3, pp. 5445–5449, 2008, doi: 10.1016/j.eswa.2008.06.121.
[20] T. Y. Tsai, C. T. Lin, and M. Prasad, "An Intelligent Customer Churn Prediction and Response Framework," in *Proceedings of IEEE 14th International Conference on Intelligent Systems and Knowledge Engineering, ISKE 2019*, 2019, pp. 928–935, doi: 10.1109/ISKE47853.2019.9170380.
[21] J. Burez and D. Van Den Poel, "Handling class imbalance in customer churn prediction," *Expert Syst. Appl.*, vol. 36, no. 3, pp. 4626–4636, 2008, doi: 10.1016/j.eswa.2008.05.027.
[22] E. Shaaban, Y. Helmy, A. Khedr, and M. Nasr, "A Proposed Churn Prediction Model," *Int. J. Eng.*, vol. 2, no. 4, pp. 693–697, 2012.
[23] O. F. SEYMEN, E. ÖLMEZ, O. DOĞAN, O. ER, and K. HIZIROĞLU, "Customer Churn Prediction Using Ordinary Artificial Neural Network and Convolutional Neural Network Algorithms: A Comparative Performance Assessment," *GAZI Univ. J. Sci.*, vol. 36, no. 2, pp. 720–733, 2022, doi: 10.35378/gujs.992738.
[24] M. C. Mozer, R. Wolniewicz, D. B. Grimes, E. Johnson, H. Kaushansky, and A. Software, "Predicting Subscriber Dissatisfaction and Improving Retention in the Wireless Telecommunications Industry," pp. 1–14, 2000.
[25] S. H. Dolatabadi and F. Keynia, "Designing of customer and employee churn prediction model based on data mining method and neural predictor," in *2nd International Conference on Computer and Communication Systems, ICCCS 2017*, 2017, pp. 74–77, doi: 10.1109/CCOMS.2017.8075270.
[26] A. Gaur and R. Dubey, "PREDICTING CUSTOMER CHURN PREDICTION IN TELECOM SECTOR USING VARIOUS MACHINE LEARNING TECHNIQUES," *2018 Int. Conf. Adv. Comput. Telecommun.*, pp. 1–5, 2018.
[27] R. G. K. Vln and P. Deeplakshmi, "Dynamic Churn Prediction using Machine Learning Algorithms - Predict your customer through customer behaviour," in *2021 International Conference on Computer*

Communication and Informatics, ICCCI 2021, 2021, pp. 4–9, doi: 10.1109/ICCCI50826.2021.9402369.
[28] C. A. Palacios, J. A. Reyes-Suárez, L. A. Bearzotti, V. Leiva, and C. Marchant, "Knowledge discovery for higher education student retention based on data mining: Machine learning algorithms and case study in chile," *Entropy*, vol. 23, no. 4, pp. 1–23, 2021, doi: 10.3390/e23040485.
[29] W. F. Wan Yaacob, N. Mohd Sobri, S. A. M. Nasir, W. F. Wan Yaacob, N. D. Norshahidi, and W. Z. Wan Husin, "Predicting Student Drop-Out in Higher Institution Using Data Mining Techniques," in *Journal of Physics: Conference Series*, 2020, vol. 1496, no. 1, pp. 0–13, doi: 10.1088/1742-6596/1496/1/012005.
[30] E. Sultan, M. Norshahriel, A. Rani, N. Filzah, M. Radzuan, and L. Huay, "Predictive Analytics on University Student Dropouts from Online Learning due to MCO," *Knowl. Manag. Int. Conf. 2021*, no. February, pp. 117–123, 2021.
[31] L. Aulck and J. Blumenstock, "Predicting Student Dropout in Higher Education," 2016.
[32] L. Kemper, G. Vorhoff, and B. U. Wigger, "Predicting student dropout: A machine learning approach," *Eur. J. High. Educ.*, vol. 10, no. 1, pp. 28–47, 2020, doi: 10.1080/21568235.2020.1718520.
[33] R. Alkhasawneh and R. Hobson, "Modeling Student Retention in Science and Engineering Disciplines Using Neural Networks," pp. 660–663, 2011.
[34] C. S. Engineering, "Machine learning approach for reducing students dropout rates," 2019.
[35] S. Rovira, E. Puertas, and L. Igual, "Data-driven system to predict academic grades and dropout," *PLoS One*, vol. 12, no. 2, pp. 1–21, 2017, doi: 10.1371/journal.pone.0171207.
[36] G. Latif, R. Alghazo, M. A. E. Pilotti, and G. Ben Brahim, "Identifying 'At-Risk' Students: An AI-based Prediction Approach," *Int. J. Comput. Digit. Syst.*, vol. 11, no. 1, pp. 1051–1059, 2022, doi: 10.12785/ijcds/110184.
[37] J. F. Superby and J.-P. V. N. Meskens, "Determination of factors influencing the achievement of the first-year university students using data mining methods," *IEEE Trans. Syst. Man. Cybern.*, no. January 2006, pp. 1–8, 2006.
[38] P. Strecht, C. Soares, L. Cruz, J. Mendes-Moreira, and R. Abreu, "A Comparative Study of Classification and Regression Algorithms for Modelling Students ' Academic Performance," *Proc. 8th Int. Conf. Educ. Data Min.*, pp. 392–395, 2015.
[39] A. U. Khasanah and Harwati, "A Comparative Study to Predict Student's Performance Using Educational Data Mining Techniques," *IOP Conf. Ser. Mater. Sci. Eng.*, vol. 215, no. 1, 2017, doi: 10.1088/1757-899X/215/1/012036.
[40] A. Daud, M. D. Lytras, N. R. Aljohani, F. Abbas, R. A. Abbasi, and J. S. Alowibdi, "Predicting student performance using advanced learning analytics," in *26th International World Wide Web Conference 2017, WWW 2017 Companion*, 2017, pp. 415–421, doi: 10.1145/3041021.3054164.
[41] B. Perez, C. Castellanos, and D. Correal, "Applying Data Mining

Techniques to Predict Student Dropout: A Case Study," *2018 IEEE 1st Colomb. Conf. Appl. Comput. Intell. ColCACI 2018 - Proc.*, pp. 1–6, 2018, doi: 10.1109/ColCACI.2018.8484847.
[42] N. Tomasevic, N. Gvozdenovic, and S. Vranes, "An overview and comparison of supervised data mining techniques for student exam performance prediction," *Comput. Educ.*, vol. 143, no. August 2019, p. 103676, 2020, doi: 10.1016/j.compedu.2019.103676.
[43] N. S. Sani, A. F. M. Nafuri, Z. A. Othman, M. Z. A. Nazri, and K. Nadiyah Mohamad, "Drop-Out Prediction in Higher Education Among B40 Students," *Int. J. Adv. Comput. Sci. Appl.*, vol. 11, no. 11, pp. 550–559, 2020, doi: 10.14569/IJACSA.2020.0111169.
[44] E. M. Queiroga *et al.*, "A learning analytics approach to identify students at risk of dropout: A case study with a technical distance education course," *Appl. Sci.*, vol. 10, no. 11, 2020, doi: 10.3390/app10113998.
[45] V. Heredia-Jimenez *et al.*, "An early warning dropout model in higher education degree programs: A case study in Ecuador," *CEUR Workshop Proc.*, vol. 2704, no. January 2022, pp. 58–67, 2020.
[46] M. M. N. Kumaran, "Forecasting and Avoiding Student Dropout Using the K - Nearest Neighbor Approach," *SN Comput. Sci.*, vol. 1, no. 2, pp. 1–8, 2020, doi: 10.1007/s42979-020-0102-0.
[47] A. A. Mubarak, H. Cao, and I. M. Hezam, "Deep analytic model for student dropout prediction in massive open online courses," *Comput. Electr. Eng.*, vol. 93, no. June, p. 107271, 2021, doi: 10.1016/j.compeleceng.2021.107271.
[48] J. Malini and Y. Kalpana, "Investigation of factors affecting student performance evaluation using education materials data mining technique," in *Materials Today: Proceedings*, 2021, vol. 47, no. xxxx, pp. 6105–6110, doi: 10.1016/j.matpr.2021.05.026.
[49] D. Thammasiri, D. Delen, P. Meesad, and N. Kasap, "A critical assessment of imbalanced class distribution problem: The case of predicting freshmen student attrition," *Expert Syst. Appl.*, 2013, doi: 10.1016/j.eswa.2013.07.046.
[50] J. Ahn, J. Hwang, D. Kim, H. Choi, and S. Kang, "A Survey on Churn Analysis in Various Business Domains," *IEEE Access*, vol. 8, pp. 220816–220839, 2020, doi: 10.1109/ACCESS.2020.3042657.
[51] I. Lykourentzou, I. Giannoukos, V. Nikolopoulos, G. Mpardis, and V. Loumos, "Computers & Education Dropout prediction in e-learning courses through the combination of machine learning techniques," vol. 53, pp. 950–965, 2009, doi: 10.1016/j.compedu.2009.05.010.
[52] N. Mduma, "Data driven approach for predicting student dropout in secondary schools," 2020.
[53] B. Huang, M. T. Kechadi, and B. Buckley, "Customer churn prediction in telecommunications," *Expert Syst. Appl.*, vol. 39, pp. 1414–1425, 2012, doi: 10.1016/j.eswa.2011.08.024.
[54] J. Demsar *et al.*, "Orange: Data Mining Toolbox in Python," *J. Mach. Learn. Res. 14*, 2013.
[55] A. Rajuladevi, "A Machine Learning Approach to Predict First-year Student Retention Rates at University of Nevada, Las Vegas," *ProQuest*

Diss. Theses, no. May, p. 70, 2018, [Online]. Available: http://libproxy1.nus.edu.sg/login?url=https://www.proquest.com/dissertations-theses/machine-learning-approach-predict-first-year/docview/2124053587/se-2?accountid=13876%0Ahttp://bb2sz3ek3z.search.serialssolutions.com/directLink?&atitle=A+Machine+Learning+.

[56] P. Sedgwick, "Pearson's correlation coefficient," *BMJ*, vol. 345, no. 7864, 2012, doi: 10.1136/bmj.e4483.

[57] E. Scornet, "Tuning parameters in random forests," *ESAIM Proc. Surv.*, vol. 60, no. 2001, pp. 144–162, 2017, doi: 10.1051/proc/201760144.

[58] A. El-Koka, K. H. Cha, and D. K. Kang, "Regularization parameter tuning optimization approach in logistic regression," *Int. Conf. Adv. Commun. Technol. ICACT*, pp. 13–18, 2013.

[59] O. Chapelle, "Choosing Multiple Parameters for Support," *Mach. Learn.*, vol. 46, pp. 131–159, 2002.

[60] E. Carrizosa, B. Martín-Barragán, and D. Romero Morales, "A nested heuristic for parameter tuning in Support Vector Machines," *Comput. Oper. Res.*, vol. 43, pp. 328–334, 2014, doi: 10.1016/j.cor.2013.10.002.

[61] M. Bashiri and A. Farshbaf Geranmayeh, "Tuning the parameters of an artificial neural network using central composite design and genetic algorithm," *Sci. Iran.*, vol. 18, no. 6, pp. 1600–1608, 2011, doi: 10.1016/j.scient.2011.08.031.