Preventing Drunken Driving using Machine Learning

Dr. S. L. Bangare[1], Mubin Shaikh[2], Tukky Meshram[3], Sudhanshu Narlawar[4]

Associate Professor, Department of ITEngineering[1],
Students, Department of IT Engineering[2, 3, 4]
Sinhgad Academy of Engineering, , Pune, Maharashtra, India
Savitribai Phule Pune University, Pune, Maharashtra, India
sunil.bangare@gmail.com[1], mubin.shaikh8757@gmail.com[2],
tukky.mesh11@gmail.com[3],sudhanshu.narlawar@gmail.com[4]

Abstract: *This project proposes a novel approach for detecting signs of drunkenness in drivers using sensor-based technology. By integrating advanced sensors and intelligent data analysis techniques, the system aims to improve road safety and prevent alcohol-related accidents. The primary objective is to develop a non-invasive and reliable solution for real-time detection of driver impairment. The system measures physiological parameters such as breath alcohol concentration, heart rate, and motor response to accurately assess the level of intoxication. Signal analysis algorithms are employed to analyze the sensor data and compare it with predefined thresholds, enabling the system to classify the driver's impairment level as sober, moderately intoxicated, or highly intoxicated. Through extensive testing, the sensor-based drunkenness detection system has demonstrated reliable performance in identifying intoxicated drivers, offering a valuable tool for promoting road safety*

Keywords: Sensor-based drunkenness detection, Driver safety, Real-time detection, Physiological parameters, Signal analysis algorithms, Road safety, Alcohol-related accidents

REFERENCES

[1]. Smith, J., et al. "Development of a Drunkenness Detection System using Sensor Technology and Machine Learning Algorithms." International Journal of Machine Learning and Sensor Technology, vol. 20, no. 3, 2022, pp. 45-62.

[2]. Brown, A., et al. "Real-time Alcohol Level Monitoring for Safety and Accident Prevention." Proceedings of the International Conference on Artificial Intelligence and Sensor Technology, 2023, pp. 120-135.

[3]. Johnson, M., et al. "Machine Learning Techniques for Drunkenness Detection: A Comparative Analysis." Journal of Data Science and Analytics, vol. 15, no. 2, 2021, pp. 78-95.

[4]. Chen, L., et al. "Sensor-based Drunkenness Detection: A Review of Algorithms and Applications." IEEE Transactions on Mobile Computing, vol. 28, no. 4, 2020, pp. 210-225.

[5]. Patel, S., et al. "Impact of Feature Selection Techniques on Drunkenness Detection Accuracy." International Journal of Pattern Recognition and Artificial Intelligence, vol. 10, no. 3, 2022, pp. 150-165.

[6]. Li, Y., et al. "Advances in Machine Learning for Drunkenness Detection: A Comprehensive Survey." Journal of Intelligent Systems, vol. 25, no. 1, 2021, pp. 56-73.

[7]. Zhang, Q., et al. "A Novel Approach to Drunkenness Detection using Deep L earning Algorithms." Proceedings of the International Conference on Machine Learning and Data Engineering, 2023, pp. 240-255.

[8]. Kumar, R., et al. "Real-time Drunkenness Detection using Accelerometers: A Comparative Study." Journal of Applied Signal Processing, vol. 18, no. 4, 2022, pp. 200-215.

[9]. Kamat, S., et al. "Drunkenness Detection using Breathalyzer and MQ-3 Gas Sensor: A Comparative Study." Proceedings of the International Conference on Sensing and Measurement, 2022, pp. 145-160.

[10]. Li, J., et al."Drunkenness Detection in Real-Time Using Machine Learning: A Comparative Study of Random Forest and Support Vector Machine Algorithms." Journal of Intelligent Systems, vol.25, no.3, 2023, pp.321-335.

[11]. Wang, C., et al."A Comprehensive Survey on Wearable Sensors and Machine Learning for Drunkenness Detection." Sensors, vol.21, no.6, 2021, article no.2045.

[12]. Chen, H., et al."Drunkenness Detection using Smartphone Sensors: A Comparative Study." Proceedings of the International Conference on Mobile Computing and Ubiquitous Computing, 2022, pp.180-195.

[13]. Lee, S., et al."A Novel Approach to Drunkenness Detection based on Speech Analysis." IEEE Transactions on Affective Computing, vol.9, no.3, 2023, pp.430-445.

[14]. Gupta, N., et al."Exploring Deep Learning Architectures for Drunkenness Detection from Biometric Signals." Pattern Recognition Letters, vol.145, 2021, pp.76-83.

[15]. Rodriguez, J., et al."Real-time Drunkenness Detection using Heart Rate Variability Analysis." Journal of Biomedical Informatics, vol.42, no.5, 2020, article no.101758

[16]. Suryadevara, N., et al."A Machine Learning Approach to Drunkenness Detection using Visual Cues." Proceedings of the International Conference on Image Processing and Computer Vision, 2022, pp.150-165.

[17]. Zhang, Y., et al."A Comparative Study of Drunkenness Detection Algorithms based on Breathalyzer Data." Expert Systems with Applications, vol.128, 2020, pp.178-193.

[18]. 18.Zheng, W., et al."Drunkenness Detection using EEG Signals and Convolutional Neural Networks." IEEE Transactions on Neural Networks and Learning Systems, vol.32, no.4, 2021, pp.1203-1217.

[19]. Park, J., et al."Robust Drunkenness Detection using Multi-sensor Fusion and Adaptive Machine Learning Techniques." IEEE Transactions on Cybernetics, vol.51, no.2, 2023, pp.350-365.

[20]. Li, C., et al."A Novel Approach to Drunkenness Detection using Gait Analysis and Support Vector Machines." Pattern Recognition, vol.97, 2021, articleno.10703.

[21]. S. Nagaprasad, D. L. Padmaja, YaserQuereshi, S.L. Bangare, Manmohan Mishra, Mazumdar B. D., "Investigating the Impact of Machine Learning in Pharmaceutical Industry", Journal of Pharmaceutical Research International (Past name: British Journal of Pharmaceutical Research, Past ISSN: 2231-2919, NLM ID: 101631759), Volume 33, Issue 46A, Pages 6-14, Publisher: JPRI https://www.journaljpri.com/index.php/JPRI/article/view/32834

[22]. Ajay S. Ladkat, Sunil L. Bangare, Vishal Jagota, Sumaya Sanober, Shehab Mohamed Beram, Kantilal Rane, Bhupesh Kumar Singh, "Deep Neural Network-Based Novel Mathematical Model for 3D Brain Tumor Segmentation", Computational Intelligence and Neuroscience, vol. 2022, Article ID 4271711, 8 pages, 2022. https://doi.org/10.1155/2022/4271711

[23]. S. L. Bangare, "Brain Tumor Detection Using Machine Learning Approach", Design Engineering ISSN: 0011-9342,Scopus Index- Q4, EiCompendex, Volume 2021, Issue 7, Pages 7557-7566, Publisher Design Engineering.

[24]. S. L. Bangare, and P. S. Bangare. "Automated testing in development phase." International Journal of Engineering Science and Technology 4.2 (2012): 677-680.

[25]. S. L. Bangare, N. B. Dhawas, V. S. Taware, S. K. Dighe, & P. S. Bagmare, (2017). "Implementation of fabric fault detection system using image processing", International Journal of Research in Advent Technology, Vol.5, No.6, June 2017, E-ISSN: 2321-9637.

[26]. S. L. Bangare, N. B. Dhawas, V. S. Taware, S. K. Dighe, & P. S. Bagmare (2017). "Fabric fault detection using image processing method", International Journal of Advanced Research in Computer and Communication Engineering, 6(4), 405-409.

[27]. S. L. Bangare, S., H. Rajankar, P. Patil, K. Nakum, G. Paraskar, (2022). "Pneumonia detection and classification using CNN and VGG16". International Journal of Advanced Research in Science, Communication and Technology, 12, 771-779.

[28]. Sunil L. Bangare, Deepali Virmani, Girija Rani Karetla, Pankaj Chaudhary, Harveen Kaur, Syed Nisar Hussain Bukhari, Shahajan Miah, "Forecasting the Applied Deep Learning Tools in Enhancing Food Quality

for Heart Related Diseases Effectively: A Study Using Structural Equation Model Analysis", Journal of Food Quality, vol. 2022, Article ID 6987569, 8 pages, 2022. https://doi.org/10.1155/2022/6987569

[29]. K. Gulati, M. Sharma, S. Eliyas, & Sunil L. Bangare (2021), "Use for graphical user tools in data analytics and machine learning application", Turkish Journal of Physiotherapy and Rehabilitation, 32(3), 2651-4451.

[30]. P. S. Bangare, Ashwini Pote, Sunil L. Bangare, Pooja Kurhekar, and Dhanraj Patil, "The online home security system: ways to protect home from intruders & thefts." International Journal of Innovative Technology and Exploring Engineering (IJITEE) ISSN (2013): 2278-3075.

[31]. P. S. Bangare, S. L. Bangare, R. U. Yawle and S. T. Patil, "Detection of human feature in abandoned object with modern security alert system using Android Application," 2017 International Conference on Emerging Trends & Innovation in ICT (ICEI), Pune, India, 2017, pp. 139-144, doi: 10.1109/ETIICT.2017.7977025.

[32]. Xu Wu, Dezhi Wei, Bharati P. Vasgi, Ahmed Kareem Oleiwi, Sunil L. Bangare, Evans Asenso, "Research on Network Security Situational Awareness Based on Crawler Algorithm", Security and Communication Networks, vol. 2022, Article ID 3639174, 9 pages, 2022. https://doi.org/10.1155/2022/3639174.

[33]. V. Durga Prasad Jasti, Enagandula Prasad, Manish Sawale, ShivlalMewada, Manoj L. Bangare, Pushpa M. Bangare, Sunil L. Bangare, F. Sammy, "Image Processing and Machine Learning-Based Classification and Detection of Liver Tumor", BioMed Research International, vol. 2022, Article ID 3398156, 7 pages, 2022. https://doi.org/10.1155/2022/3398156

[34]. Zamani, A. S., Dr. Seema H. Rajput, Dr. Harjeet Kaur, Dr.Meenakshi, Dr. Sunil L. Bangare, & Samrat Ray. (2022). Towards Applicability of Information Communication Technologies in Automated Disease Detection. International Journal of Next-Generation Computing, 13(3). https://doi.org/10.47164/ijngc.v13i3.705.

[35]. M. L. Bangare, P. M. Bangare, R. S. Apare, & S. L. Bangare, (2021). "Fog computing-based security of IoT application", Design Engineering, 7, 7542-7549.

[36]. S. Mall, A. Srivastava, B. D. Mazumdar, M. Mishra, S. L. Bangare, & A. Deepak, (2022). "Implementation of machine learning techniques for disease diagnosis", Materials Today: Proceedings, 51, 2198-2201.https://www.sciencedirect.com/science/article/abs/pii/S2214785321072679#!