

- [10] Shao Y C, Li C D and Cao Y, "Intelligent Analysis of Classroom Behavior in Teaching Reform," *Teaching and Management*, 2021(15): 29-33.
- [11] Chiu Y C, Tsai C Y and Ruan M D, "Mobilenet-SSDv2: "An improved object detection model for embedded systems", 2020 International Conference on system science and Engineering (ICSSE), 2020: IEEE, pp. 1-5.
- [12] Zhang W, Xu Q, "Optimization of college English classroom teaching efficiency by deep learning SDD algorithm," *Computational Intelligence and Neuroscience*, 2022, 2022.
- [13] Wang G H, Zhang X and Zheng H, "Analysis of students' classroom learning status based on deep learning," *Journal of Higher Education*, vol. 8, no. 31, pp. 1-5, 2022.
- [14] Rosati R, Romeo L and Silvestri S, "Faster R-CNN approach for detection and quantification of DNA damage in comet assay images," *Computers in Biology and Medicine*, 2020, 123: 103912.
- [15] L Yuan, "Research on English Hybrid Assisted Teaching System Using Contextual Support of R-CNN," *Wireless Communications and Mobile Computing*, 2022, 2022.
- [16] Xu J Z, Deng W and Wei Y T, "Automatic Recognition of Student's Classroom Behaviors based on Human Skeleton Information Extraction," *Modern Education Technology*, vol. 30, no. 5, pp. 108-113, 2020.
- [17] He X L, Yang F and Chen Z Z, "The Recognition of Student Classroom Behavior based on Human Skeleton and Deep Learning," *Modern Education Technology*, vol. 30, no. 11, pp. 105-112, 2020.
- [18] Liao P, Liu C M and Su H, "A deep learning-based system for detecting and analyzing abnormal student behavior in the classroom," *Electronic World*, 2018(08): 97-98.
- [19] Jiang X Y, Zhang Z W and Tan S Q, "Student classroom behavior identification based on residual network," *Modern Computers*, 2019(20): 23-27.
- [20] Liu X Y, Ye S P and Zhang D H, "Improved multi-objective regression student classroom action detection method," *Computer Engineering and Design*, vol. 41, no. 9, pp. 2684-2689, 2020.
- [21] Yang B, Song X N and Feng Z Q, "Gesture Recognition in Complex Background Based on Distribution Features of Hand," *Journal of Computer-Aided Design & Computer Graphics*, vol. 22, no. 10, pp. 1841-1848, 2010.
- [22] Pantic M., Rothkrantz and L.J.M., "Facial Action Recognition for Facial Expression Analysis From Static Face Images ," *IEEE transactions on systems, man, and cybernetics, Part B.Cybernetics*, vol. 34, no. 3, pp. 1449-1461, 2004.
- [23] Ding R, Song G D and Lin X G, "Comparison of Eigenface and Elastic Matching in Human Face Recognition," *Computer Engineering and Applications*, 2002(07): 1-2+19.
- [24] Jia L Y, Zhang C H and Zhao X Y, "Analysis of Students Status in Class Based on Artificial Intelligence and Video Processing," *Modern Education Technology*, vol. 29, no. 12, pp. 82-88, 2019.
- [25] Ma X L, Guo S N and Wu Y H, "The Recognition and Application of Educational Emotion Based on Image Analysis," *Modern Education Technology*, vol. 30, no.2, pp. 118-121, 2020.
- [26] Han L, Li Y and Zhou Z J, "Research on the Relationship of Critical Thinking and Community of Inquiry Model," *Modern Distance Education Research*, 2017(04): 97-103+112.
- [27] Iain R.Murray and John L.Arnott,"Toward the simulation of emotion in synthetic speech: a review of the literature on human vocal emotion ,"*The Journal of the Acoustical Society of America*,vol. 93,no. 2, pp. 1097-108, 1993.
- [28] Wang H, Guo H and Zhang K, "Automatic sleep staging method of EEG signal based on transfer learning and fusion network," *Neurocomputing*, 2022, 488: 183-193.
- [29] Hemanth D J, "EEG signal based modified Kohonen neural networks for classification of human mental emotions,"*Journal of Artificial Intelligence and Systems*, vol. 2,no. 1,pp. 1-13, 2020.
- [30] Zhou J G, Tang D M and Peng Z," Students' Expression Analysis in the Classroom based on Gradient Boosting Decision Tree and Convolution Neural Network," *Journal of Chengdu University of Information Engineering*, vol. 32, no. 5, pp. 508-512, 2017.
- [31] Zhou P X, Deng W and Guo P Y," Research on Intelligent Recognition of S-T Behavior in Classroom Teaching Video," *Modern Education Technology*, vol. 28, no. 6, pp. 54-59, 2018.
- [32] Gong w, "Design and Implementation of Student Learning Behavior Recognition System Based on Key Points Detection of Bones," *Jilin University*, 2019.
- [33] Hinton G E and Salakhutdinov R R, "Reducing the dimensionality of data with neural networks," *Science*, 2006, 313 (5786) : 504—507.
- [34] Jermsittiparsert K, Abdurrahman A and Siriattakul P, "Pattern recognition and features selection for speech emotion recognition model using deep learning," *International Journal of Speech Technology*, vol. 23, pp.799-806, 2020.
- [35] Zhang Yiwen, Wu Zhe and Chen Xianjin, "Classroom behavior recognition based on improved yolov3", 2020 International Conference on Artificial Intelligence and Education (ICAIE), 2020: IEEE, pp. 93—97.
- [36] Hou C K, "Research on Automatic Recognition of classroom teacher behavior based on multimodal fusion," *Huazhong Normal University*, 2020.