

Evaluation System for Dancing Enlightenment Posture Training Using the Skeleton Tracking of Microsoft Common Objects in Context

Ruilong Huang*, Huifang Deng*, Ruei-Yuan Wang**, [Bing-Yuh Lu*](mailto:FranklinLu888@outlook.com),
Hongwei Ren*, Yiheng Chen*, Jianwen Ye*, Jinhui Chen*, Yingbo Jia*, Leyang Lang*

*School of Automation, Guangdong University of Petrochemical Technology, Maoming City, Guangdong, China

**School of Science, Guangdong University of Petrochemical Technology, Maoming City, Guangdong, China

FranklinLu888@outlook.com

Abstract—Dance enlightenment education is of great significance to children's physical health. Therefore, we developed an evaluation system to correct the posture of the beginners for their dancing training. The pre-train network is based on the Open Neural Network Exchange. The pattern of human pose is the skeleton in the Microsoft Common Objects in Context dataset. We designed a quantitative presentation to calculate the similarity of the postures between the skeletons of the dancing beginner and target image of the training, and obtained objective evaluation indicators based on the recorded of the angle differences of limbs to calculate the score. 8 angles of the joints have been computed and presented in the evaluation system. The results show that the dancing beginner can correct her postures to approach the target image of the training. She improved the score from 94 to 96. Now, parents pay more and more attention to the quality education of their children. The AI-aided dancing training will make the beginners to learn the performances of the postures much easier in any time and any location. Therefore, the learning of dancing will become more interesting for the beginners.

Keywords—Dance, Deep Learning, Evaluation System, MatLab, Microsoft Common Objects in Context, Posture, Skeleton, Training.



Ruilong Huang received his B.Eng in industry automation from Northeast Petroleum University in 2002, M.Eng in control theory and control engineering from South China University of Technology in 2005. He is currently a lecturer with Faculty of Automation, GDUPT Maoming City, Guangdong, China. His academic interests focus on intelligent detection and control technology.



Huifang Deng received her B.S. from the Faculty of Automation, Guangdong University of Petrochemical Technology (GDUPT), Guangdong, China in June, 2023. She got the scholarships of excellent learning at GDUPT many times. She is currently a junior engineer at Chinese Huadian Corporation, Guangdong, China. Her research interests include AI and image processing technologies.



Ruet-Yuan Wang received his PhD in Science from the Institute of Geosciences at the Chinese Culture University in Taiwan in 2010; he has been served as a postdoctoral researcher at the Spatial Information Research Center (SIRC) of Taiwan University (NTU) and the Center for Space and Remote Sensing Research (CSRSR) of Central University (NCU). He is currently serving as an associate professor in the Department of Geographic Sciences at the Faculty of Science, Guangdong University of Petroleum and Chemical Technology (GDUPT), Maoming City, Guangdong, China. He primarily engaged in teaching courses in geographic science, remote sensing (RS), and geographic information systems (GIS). His academic interests focus on geographic science related fields, environmental ecology, remote sensing carbon monitoring, tourism geography, etc. His application technology mainly focuses on decision support (DSS), knowledge management (KM), artificial neural networks (ANN), big data, remote sensing technology, and geographic information system technology (GIS). He previously served as expert peer reviewers of various journals for Sustainability; Land; Forests; Expert Systems with Application; Business Management and Economics, Journal of Coastal Research (JCR), etc.



Bing-Yuh Lu received his BS in electrical engineering from National Central University in 1988, MS in electrical engineering from National Taiwan University in 1993, and PhD in electrical engineering from National Taiwan University in 2000. He is currently a professor with Faculty of Automation, Guangdong University of Petrochemical Technology (GDUPT), Maoming City, Guangdong, China. He has been an instructor (1993 to 2000), an associate professor (2000 to 2016), and a full professor (2016 to 2019) with the Department of Electronic Engineering, Tunghnan University, New Taipei City, Taiwan, from 1993 to 2019. He is a member of IEEE, has been a member of the Technical Committee IEEE International Conference on Advanced Communication since 2015, and served as a reviewer for some international journals. His academic interests include electronic circuits and systems, medical engineering, acoustics, modeling, and signal measurement and processing.



Hongwei Ren received her B.S. degree in IndustryAutomation from Northeast Electric Power Univer-sity, Jilin, China, in 1998, her M.S. degree andPh.D. degree in Systems Engineering from SouthChina University of Technology, Guangzhou, Chinain 2002 and 2017,respectively.She is currently an Associate Professor in theSchool of Automation, Guangdong University ofPetrochemical Technology, Maoming, China. Herresearch interests include synchronization of com-plex networks, consensus of multi-agent systems andstochastic dynamic system analysis and control.



Yiheng Chen is a student with Faculty: of Automation, Guangdong University of Petrochemical Technology, Guangdong, China.He won the third prize of 2022 "Cossberg Cup" Engineering College Students' Comprehensive Experimental Skills Competition of Guangdong University of Petrochemical Technology, and participated in the 2022 "Application Innovation" project of "Sail Plan" of Maoming Green Chemical Research Institute. His research interests include PCB hardware design and fuzzy control.

Jianwen Ye,is a student majoring in Electrical Engineering and Automation at Guangdong University of Petrochemical Technology, has won university-level scholarship and the second prize of Guangdong Provincial Engineering College Students' Comprehensive Experimental Skills Competition.

Jinhui Chen,a student majoring in Electrical Engineering and Automation at Guangdong University of Petrochemical Technology, has won university-level scholarship and the second prize of university-level innovation and Entrepreneurship Competition.

Yingbo Jia ,a student majoring in measurement and control technology and instrumentation at Guangdong University of Petrochemical Technology, has won first-class scholarships for many times

Leyang Lang is a student with Faculty of Automation, Guangdong University of Petrochemical Technology, Guangdong, China. He has won the third prize of the Guangdong Provincial Research Cup. His main research interests are geographic remote sensing monitoring, machine learning, and deep learning.