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Accuracy improvement of hand pose aware isolated sign language recognition using deep learning

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Abstract

Hand sign language recognition from the video is a challenging research area in computer vision, in which the performance is affected by hand occlusion, fast hand movement, illumination changes, or background complexity, just to mention a few. In recent years, deep learning approaches have achieved state-of-the-art results in the field, though previous challenges are not completely solved. In this talk, we present our proposed deep learning-based models for efficient automatic isolated hand sign language recognition. After doing a holistic study in this area and the related areas, we proposed some deep-based models to improve recognition accuracy. Since hand detection was the first step in our models, we used the Single Shot Detector (SSD) model and trained it using five online annotated sign dictionaries. Different deep architectures, such as 2DCNN, 3DCNN, RBM, LSTM, and GRU, were employed and combined to make an improvement in hand sign language recognition. Furthermore, we contributed to a large-scale dataset, including 10000 RGB videos from 100 Persian sign words and 10 contributors. We performed a step-by-step analysis of our models and the corresponding results on some public datasets. Results on the challenging datasets confirmed the relative accuracy improvement of the proposed models in comparison with state-of-the-art alternatives in isolated hand sign language recognition and related areas.

Biograph

Razieh Rastgoo received the B.Sc. Degree in Computer Engineering, Hardware, from Shiraz University of Iran. After achieving her M.Sc. in Artificial Intelligence, she obtained her Ph.D. from Semnan University in Iran and Barcelona University in Spain under supervision of Dr. Kouros Kiani and Prof. Sergio Escalera. Furthermore, she is a researcher at HIS Company in Iran and HUPBA Lab in University of Barcelona, Spain. Her interest areas are Artificial Intelligence, Machine Learning, Deep Learning, Computer Vision, Sign Language, Smart Grids, and Routing Protocols.