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A Motion Dictionary to Real-Time Recognition of Sign Language Alphabet Using Dynamic Time Warping and Artificial Neural Network

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Abstract : Computacional recognition of sign languages aims to allow a greater social and digital inclusion of deaf people through interpretation of their language by computer. This article presents a model of recognition of two of global parameters from sign languages; hand configurations and hand movements. Hand motion is captured through an infrared technology and its joints are built into a virtual three-dimensional space. A Multilayer Perceptron Neural Network (MLP) was used to classify hand configurations and Dynamic Time Warping (DWT) recognizes hand motion. Beyond of the method of sign recognition, we provide a dataset of hand configurations and motion capture built with help of fluent professionals in sign languages. Despite this technology can be used to translate any sign from any signs dictionary, Brazilian Sign Language (Libras) was used as case study. Finally, the model presented in this paper achieved a recognition rate of 80.4%.

Keywords : artificial neural network, computer vision, dynamic time warping, infrared, sign language recognition
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