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Home-based exercise evaluation using wrist sensors

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Exercises have proved effectiveness and efficiency in major disease prevention and recovery. Most existing exercises are supervised exercises like physical therapies. They are too expensive for many patients. Home-based unsupervised exercises are significantly inexpensive compared with supervised exercises; however, how to guarantee the quality of the home-based unsupervised exercises is a challenge. Recent emerging Internet of Things (IoT) technologies provide a potential solution by deploying sensors around exercisers' body and analyzing, collected sensing data to provide an evaluation towards the quality of the performed exercise. Most of existing solutions requires deploying sensors at different body areas. This makes it difficult to deploy such systems and upset the exercisers. In addition, it increases the efforts needed to calibrate the sensor data because of the sensor misposition and noises. With many wearable devices such as Apple watch and smart bands available and equipped with activity sensors, it is sufficient to utilize these sensors to develop exercise evaluation systems. This solution aims to develop algorithms that is lightweight and evaluates the accuracy of the performed exercises only based on simple activity sensors deployed at the wrist.

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