Adaptive tuner for Workouts

It is important for runners to exercise at an appropriate running cadence. As music tempo has an impact on the exercise and the endurance activities, it might also serve as a means to shape running cadence. We are planning to design a smart runner's music player. The player will dynamically detect the cadence of the user in real-time, and play the music whose tempo most matches the runner's cadence. Our primary design incorporates the use of builtin Accelerometer in modern smartphones to detect the cadence (steps) of the user. When the user is running or walking, there would be cyclical changes in X-axis, Y-axis and Z-axis data output by the Accelerometer. Based on this pattern, we will use existing algorithms to design a pedometer that detects the user's cadence and cadence changes in real time. When the user's cadence changes, the player will automatically adapt and switch to the most matching music from the music library. To obtain the tempo of the music, our app also includes the tempo detection function, which allows the user to detect the tempo of the music through a sequence of simple taps on the screen. This can be done at the time when each music clip is first imported into the library. This results in an immense personalised listening experience based on the runner's speed.

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