Abstract—Gait velocity has received increasing attention as an indicator of cognitive and neuromotor health, but assessing gait characteristics in the clinic alone may not provide a precise way to determine the onset of decline. Continuous monitoring systems are emerging as new tools in telemedicine to counteract this problem. This work presents a new Smartphone application that enables a user to conduct a ten meter walk test and upload the results to a data cloud to be further analyzed. A tester conducted walking trials wearing a Smartphone in the right jeans pocket. An algorithm to determine total trial time and variability of step time intervals was evaluated against audio recordings of the trials. The average error between intervals measured in tests with limited false positives was 3%. Half of the trials examined in this paper contained significant false positives, indicating that further development of the algorithm is required before it is practical to run it on the server. Overall time calculations showed an average difference of 274 ms. Thus, the system has the potential to provide a useful means of tracking gait characteristics over time.

I. INTRODUCTION

The study of gait has received increasing focus in the medical community. Many characteristics of gait, including speed, variability, and path tortuosity are affected and may predict decline in patients with neurological diseases such as depression, dementia, and Parkinson’s disease[1][2][3]. The study of gait speed has received particular attention to the point that it has been referred to as “the sixth vital sign” [4]. High stride variability has also been shown to be associated with frailty and has the potential to predict mobility problems and the likelihood of falls [5]. Confining these tests to clinical visits, however, gives a limited view of a person’s health over a long period of time and has a restricted ability.

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