



## Design and development of a system for Wrist Pulse Signal Analysis and Evaluation of Reliability and Validity Based on Traditional Iranian Medicine

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### Abstract:

**Background and Purpose:** In traditional Iranian medicine, pulse measurement is one of the main methods for diagnosing a person's disease or condition. One of the problems that can arise in this way is the dependence of the ultimate diagnosis of pulse features on the experience and expertise of physician. Perhaps this is the reason why this method cannot be combined with modern medical methods. The question is, can a machine be made to overcome this problem. This is the purpose of this research. This paper outlines a system design for measuring pulse signals based on traditional Iranian medicine.

**Methods and Materials:** The first stage research was conducted explanatively using a consultation with specialists in traditional medicine and medical engineering and the study of experiences in other countries and a device for recording pulse was designed and made using traditional Iranian medicine. In the second stage, in order to determine its reliability and validity, the test was performed on 12 subjects (5 repetitions per person) and using traditional medicine reference books, the pulse features comparisons in traditional medicine with quantitative characteristics of pulse signals were studied and described.

**Results:** The results of this study showed that the reliability of the instrument for pulse measurement has a maximum correlation coefficient of  $R = 0.82$ . Finally, the nine features of pulse (according to traditional medicine) are equalized to the quantitative characteristics of the pulse signal.

**Conclusion:** It seems that the design and construction of a device that is able to measure the pulse signal according to traditional Iranian medicine is possible and probably can increase the reliability of the diagnostic results based on the traditional. Therefore, we recommend its empirical and clinical evaluation.

**Keywords:** Iranian Traditional Medicine, Pulse Taking, Pulse features, Pulse Signal, Sensor Array, quantitative characteristics of pulse signal.

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