

November 8, 2019

Dear Editors,

Thank you for your invitation to submit an extended version of our paper presented at the 2019 IEEE International Workshop on Metrology for Industry 4.0 and IoT (MetroInd4.0&IoT 2019, General Chairs: Leopoldo Angrisani, Pasquale Daponte, Emilio Sardini) to this special Issue on ACTA IMEKO.

We are pleased to submit an original article entitled “**Validation of a modular and wearable system for tracking fingers movements**” by Michela Borghetti, Paolo Bellitti, Nicola Lopomo, Mauro Serpelloni, Emilio Sardini, for consideration for publication in ACTA IMEKO.

In this manuscript, we proposed a portable and modular system for measuring the fingers movements, especially in industrial settings. The system basically consists of more independent measuring units able to measure flexion and extension of the proximal interphalangeal joint (of distal interphalangeal joint in case of thumb) with stretch sensors, and the orientation of the proximal phalanx by using IMUs. All the measuring units communicates with the same external unit (for example a laptop) through a Bluetooth communication. The system can be worn on both hands and on any finger, without significant changes. In the conference paper, we demonstrated the possibility to combine two measuring units to support the workers in typical tasks, such as the supervision of assembly tasks or the recognition of simple gestures. In this extended version, we focused on the validation of the system proposed in the conference paper by using a marker-based opto-electronic system. In particular, in section 3, we described the experimental setup and the protocol used for data validation. In section 4, we compared and discussed the experimental results obtained by both measuring systems. The experimental results need to be considered for data interpretation when the system is used for monitoring the fingers movements and gestures.

We believe that this manuscript is appropriate for publication by ACTA IMEKO because it focus on the measurement of the finger movements and on the validation of the proposed measurement system by using an optoelectronic system. This goal is one of the major aims of ACTA IMEKO Journal.

This manuscript has not been published and is not under consideration for publication elsewhere.

Thank you for your consideration.

Sincerely,

Michela Borghetti, Paolo Bellitti, Nicola Lopomo, Mauro Serpelloni, Emilio Sardini