

Marie Skłodowska Curie Individual Fellowship 2020

Expression of Interest for hosting Marie Curie Fellows

1. Supervisor (name and e-mail address)

Paolo Ferrari
paolo.ferrari@unibs.it

2. Department (name and address)

Department of Information Engineering
Via Branze, 38
25123 Brescia - Italy

3. Panel (choose one)

- Chemistry (CHEM)
- Social Sciences and Humanities (SOC)
- Economic Sciences (ECO)
- Information Science and Engineering (ENG)**
- Environment and Geosciences (ENV)
- Life Sciences (LIF)
- Mathematics (MAT)
- Physics (PHY)

4. Description of your research activities (max 10 lines)*

The research is based on real-time systems applied to: performance measurement and optimization of industrial communication networks, time synchronization of distributed networks, sensor signal processing. The main goal is the development of measurement methods and instruments for evaluating the performance of transmission systems and communication protocols, with particular attention to industrial solutions. The research activity includes: fieldbus systems, Real-Time Ethernet networks, wireless networks for sensors and controls, software defined radio, sensor networking, smart sensor interfaces, and time synchronization through Ethernet (or wireless). In the last years, the design and performance evaluation of smart architectures for distributed measurement systems have been investigated, leveraging on (Industrial) Internet of Things applied to Industry 4.0, smartcity and smart vehicles application scenarios. Some of the topics of interests are low-power wide range wireless technologies, middlewares for backend implementation and service oriented architectures.

5. Key-words

Internet of Things (IoT), Wireless sensors networks, Distributed measurement systems, Industry 4.0, Low-power wide area network (LPWAN), Industrial automation, Industrial Fieldbus, Real-Time Ethernet, Time Sensitive Networks, Time synchronization, Clock synchronization, Smart vehicles, Electric vehicles, Smart city, smart sensor interfaces, software defined radios.

6. Short CV of the supervisor (max 5 lines)

Paolo Ferrari is a Full Professor in electric and electronic measurements. He has several applied research contracts with companies in the field of real-time networks and sensor networks for industry. In 2012, he received the TECHNICAL AWARD of the IEEE Instrumentation and Measurement Society. From 2004 to 2020 he held various positions within the IEC (International Electrotechnical Commission) in the field of industrial communications. He is the author of more than 150 international papers.

7. List of 5 main publications of the supervisor

Ferrari, P., Flammini, A., Sisinni, E., Rinaldi, S., Brandao, D., Rocha, M.S.
Delay Estimation of Industrial IoT Applications Based on Messaging Protocols
(2018) IEEE Transactions on Instrumentation and Measurement, 67 (9), art. no. 8330035, pp. 2188-2199.
DOI: 10.1109/TIM.2018.2813798

Sestito, G.S., Turcato, A.C., Dias, A.L., Rocha, M.S., Da Silva, M.M., Ferrari, P., Brandao, D.
A method for anomalies detection in real-time ethernet data traffic applied to PROFINET
(2018) IEEE Transactions on Industrial Informatics, 14 (5), pp. 2171-2180.
DOI: 10.1109/TII.2017.2772082

Rizzi, M., Ferrari, P., Flammini, A., Sisinni, E.
Evaluation of the IoT LoRaWAN Solution for Distributed Measurement Applications
(2017) IEEE Transactions on Instrumentation and Measurement, 66 (12), art. no. 8036410, pp. 3340-3349.
DOI: 10.1109/TIM.2017.2746378

Rinaldi, S., Della Giustina, D., Ferrari, P., Flammini, A., Sisinni, E.
Time synchronization over heterogeneous network for smart grid application: Design and characterization of a real case
(2016) Ad Hoc Networks, 50, pp. 41-57.
DOI: 10.1016/j.adhoc.2016.04.001

Carbone, P., Cazzorla, A., Ferrari, P., Flammini, A., Moschitta, A., Rinaldi, S., Sauter, T., Sisinni, E.
Low complexity UWB radios for precise wireless sensor network synchronization
(2013) IEEE Transactions on Instrumentation and Measurement, 62 (9), art. no. 6524047, pp. 2538-2548.
DOI: 10.1109/TIM.2013.2259101

*Please consider that the preparation of a Marie Curie proposal requires some time. Fellow and supervisor have to agree on a project and training opportunities for the fellow.