

ELECTRICAL, ELECTRONICS AND COMMUNICATIONS ENGINEERING

EDGE real-time predictive maintenance framework

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Context of the research activity	Study and development of an EDGE real-time predictive maintenance framework (hardware and software) based on AI/ML algorithms for industrial applications
Objectives	The PhD proposal concerns the study of a centralized predictive maintenance framework that automatically detects anomalies and computes the RUL (Remaining Useful Life) of complex industrial machines' components. The first challenge concerns the development of a real-time system based on machine learning algorithms using an edge computing approach by means of a highly skilled microcontroller. The second challenge of this research will concern the design of "intelligent components" also employing additive manufacturing and the innovative 3D MID technology able to create a 3D electronic circuit around components' surface. The research will be carried on in collaboration with leader companies in the field of ATE (Automatic Testing Equipments) systems (SPEA in Italy and ETEL in Switzerland).

Skills and competencies for the development of the activity

- Solid knowledge in Embedded Electronics and Computer Engineering
- Application Layer analytical development skills
- Deep knowledge about machine learning (supervised learning, reinforcement learning)
- Experience with deployment on embedded systems
- Strong programming skills
- ROS/ROS2 skills
- EDGE computing
- Team working capabilities