



**UNIVERSITÀ
DI TRENTO**

**Department of
Information Engineering and Computer Science**

**Università degli Studi di Trento
Dipartimento di Ingegneria e Scienza dell'Informazione**

Scholarship Reference	F-Gruppo-GPI
Company (name and address)	GPI, Via Ragazzi del '99, 13, 38123, Trento (Italy)
Type of Scholarship	<ul style="list-style-type: none">• Professional Training
Title of Scholarship	Online model for robotics system status understanding
Industrial Tutor (full name + email address)	Marco Lechtaler (marco.lechthaler@gpi.it)
Academic Supervisor (full name + email address)	To be defined

Short Description of Internship and Thesis Activities, and Expected Outcome:

The objective of this thesis project is to build an online model that can understand the health status of a robotic system. By analyzing the stream of input data, the model should be able to determine whether the robot is functioning properly or if there is a specific component that requires attention.

Objectives:

1. Develop an online model: design and implement an online model capable of analyzing a stream of input data from the robotic system in real-time and providing insights into its health status. The model should be able to classify the robot as either functioning properly or requiring attention/maintenance
2. Identify key features: identifying the crucial features or indicators that can be used to assess the health of the robotic system. These features may include sensor data, performance metrics, or other relevant parameters that provide valuable information about the system's condition
3. Find the trade-off between accuracy and performance on low-performance hardware. Optimize or adapt the model architecture, algorithmic optimizations, and efficient resource utilization to ensure the model can run effectively on resource-constrained systems

Activities:

1. Data flow establishment: establish a robust data flow system to collect relevant information from the robotic system for both training and production phases. This entails gathering data from sensors, performance logs, and other sources to construct a comprehensive dataset suitable for analysis



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2. Key feature identification: analyze the collected data to identify the key features that correlate with the health status of the robotic system. This step involves statistical analysis, data exploration, and feature engineering to select the most informative indicators
3. Model design and implementation: design and develop the online model using artificial intelligence or machine learning techniques. The model should classify the robot's components health status
4. Performance analysis: measure the accuracy and reliability of the model using the designated low-performance hardware

Required Candidate Skills and Prerequisites: