



POLITECNICO
MILANO 1863

DIPARTIMENTO DI MECCANICA

3D Vision

3D acquisition through active and passive systems and measurement systems integration

Description:

3D Vision Lab is part of the Measurement and Experimental Techniques area, in the Mechanical Engineering Department. Our expertise focuses on non-contact measurement techniques, with particular interest in the application of 2D and 3D techniques for computer vision. A key characteristic of is the capability of designing both innovative machine vision hardware and novel algorithms for the data analysis. We cooperate with both academic and industrial partners to develop new solutions, working prototypes or products ready for the market.

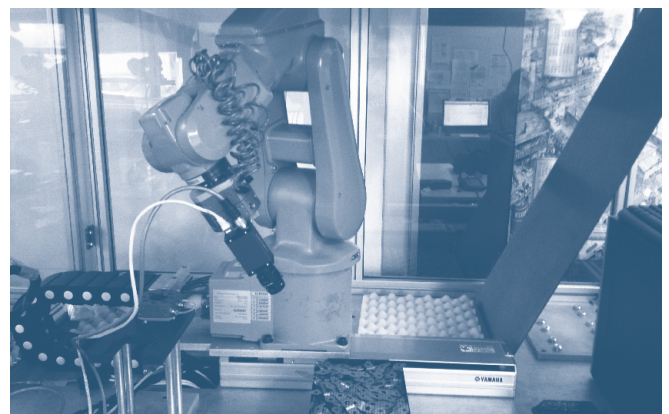
High flexibility of the inspection techniques is guaranteed also by the UAVs equipped with 2D and 3D vision system developed in this laboratory.

References:

ABB, National Instruments, Milan A.C., ISS, Steriline Robotics, North Sails, Politecnico di Milano Wind tunnel.

Instruments & Facilities:

- Industrial cameras (Hyperspectral Cameras, Near InfraRed cameras, High Dynamic Range cameras, High Speed cameras, Industrial smart cameras).
- Lighting solutions to enhance 2D vision-based measurements.
- Stereoscopic systems to perform 3D measurements.
- Structured Light and Time of Flight sensors for dense 3D point clouds reconstructions.
- Triangulation sensors for profile analyses
- Lenses for dimensional measurements of components



Activities:

Industrial applications

- Development of AI based systems for 3D object recognitions.
- Development of Hyperspectral machine vision systems for food industry
- Development of stereoscopic vision systems for robotic applications.
- Data fusion between NIR and HDR cameras for thermal analyses.
- Development of industrial solutions for high-temperature 2D and 3D vision applications
- Implementation of algorithms for image processing.
- Development of embedded vision solutions for supporting human operators.

Sports

- Dense point cloud reconstructions and geometrical analysis of sail shapes both in wind tunnel and in full scale conditions.
- Particle images velocimetry (PIV) with high-speed cameras in wind tunnel.
- Motion analysis and gesture recognition for post traumatic rehabilitation.
- Measurement of cyclist biomechanics in wind tunnel tests.

