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ANASA Robotic Sorter: Design, Implementation, Pilot Run

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Urban waste management is a most challenging issue for modern societies. Reducing pollution and saving environmental resources provides significant opportunities for local, national and international economic growth. The ANASA project aims at developing, integrating and commercializing an autonomous robotic system for categorizing and separating recyclable materials. The development of an automated procedure for recyclable waste separation is significantly contribute in increasing the (currently low) recycling rates in Greece, for the benefit the local societies and the economic enhancement of recycling activities across the country.

The "*ANASA*" Robotic Waste Separator (RWS) has significant advantages over the existing ordinary recycling systems; i.e. high reliability in object recognition (material detection), short separation cycle (high speed), significantly low installation volume, low cost and ease of application to both old and new recycling industries. The development of the Robotic Waste Separator is based on the integration of mature technologies, namely the identification and spatial recognition of recyclable materials and the targeted robot picking-and-placing of these materials to the appropriate classification bin, providing a complete solution for both the main parts of the recycling process.

By now, a trial version of the system has implemented and installed in a lab-room. The mechanical system integration is composed by six main parts: (i) the ABB IRB360 DELTA robot, (ii) an external vision camera system for object detection, (iii) a conveyor belt of 4,5x0.8m length and 135-277 mm/sec speed range (iv) a robot workspace cage with steel construction for high speed, (v) a vacuum generator with pressurized air supply of 10 bars which provide a low pressure to the suction cup, and (vi) a vacuum gripper suction cup that designed and made in-house for the specific application.

The final goal is ANASA RWS be deployed in two different urban waste management industrial units, in ESDAK (processing composite wastes) and in DEDISA (processing recyclable wastes), where the system's reliability and validity will experimentally be tested in real industrial environments. The long and extensive operation of the system in hard industrial conditions will directly focus the adjustment of the RWS parameters to achieve optimal performance and excellent waste separation results.

Με τη συγχρηματοδότηση της Ελλάδας και της Ευρωπαϊκής Ένωσης