Journal of Robotics

Special Issue on
Robot Vision

CALL FOR PAPERS

Biological vision is the primary sense for animals to perceive the environment beyond the reach of their direct contact. Consequently, artificial vision for robots serves as an important mean for remote perception and interaction with the environment. This includes tasks such as object recognition and localization, obstacle avoidance, 3D perception for manipulation planning, self-localization, mapping, and human-robot interaction. Recent advances in computer vision and learning based techniques are increasingly applied to robots to augment and even to replace other robot sensors such as sonar, infrared, odometry, and laser rangefinders and GPS. In contrast to other computer vision applications, robot vision is generally integrated with the overall system with additional constraints regarding size, weight, computation cost, energy consumption, working range, and so forth. Since vision is typically integrated with other sensors, there is also a considerable opportunity for sensor fusion and active vision.

This special issue aims at algorithms, implementations, novel ideas, and applications of robot vision, with the emphases on localization, perception, learning, and 3D sensing.

Potential topics include but are not limited to the following:

- ▶ Visual odometry
- ▶ Visual navigation
- ▶ 3D SLAM, semantic SLAM, and cooperative SLAM
- ▶ Visual place recognition
- ▶ Visual servoing
- ▶ Visual tracking
- ▶ Visual manipulation, including object recognition and pose estimation
- ▶ Integration or fusion of vision with other sensing modalities
- ▶ Robust vision techniques
- ▶ Novel visual sensors (RGB-D, HDR, wide field of view cameras, etc.)
- ▶ Interaction/fusion with other sensors (force, tactile, etc.)
- ▶ Novel computational algorithms and architectures
- ▶ Metrics for performance and robustness of vision systems
- ▶ Implementations on the GPU, FPGA, or embedded systems
- ▶ Robot vision applications (space robotics, underwater robotics, manufacturing, manipulation, etc.)

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