

CALL FOR PAPERS
IEEE Sensors Journal Special issue on

Sensors in Machine Vision of Automated Systems

Sensors are the interface of technical systems with the environment to detect physical, chemical, and/or biological phenomena for a wide range of applications. Sensors in machine vision applications enable engineering systems with visual properties that could exceed the human visual ability. With the use of the appropriated sensors, machine vision systems can measure specific coordinates, selected objects or a whole scene. This way, the reality can be imagined and augmented in comparison with the human image perception.

It is intended that this Special Issue of the IEEE Sensors Journal will show the state of art in theory, design, fabrication, manufacturing and application of devices for sensing in machine vision, highlight electronics and physics aspects of sensors and integrated sensor-actuator technologies, as well as novel mathematical methods for advanced processing of sensors signals and applications of artificial intelligence for machine vision capability improvement.

The analysis and processing of signals, images and data from sensors in machine vision systems contribute to explore novel improvements for 2D/3D coordinate measurements, detection, inspection, tracking, 3D reconstruction, and image augmentation.

Original research contributions, tutorials and review papers are sought related to the following topics (but not limited to):

- **Sensors in machine vision for application on science and industry** (material incoming inspection, soldering, pieces handling, counting, inventorying, cutting and assembling, process support, quality inspection, packing and shipping).
- **Sensors in machine vision for vehicles/robot navigation** (inertial measurement units, GPS, gyroscopes, satellites, accelerometers, lasers, cameras, radar).
- **Image/scanning sensors technologies for indoor and outdoor stereo vision** (laser scanners, time-of-flight scanners, structured light scanners, modulated light scanners, stereo vision scanners, alternative vision systems).
- **Image/scanning sensors with sensitivity increase in low-light conditions** (TDI CCD: time delay Integration charge-coupled devices in sensing of objects in movement; **sensor BS**: back-side illumination, digital image sensors with new disposition of photo-sensing elements for augmented quantity of captured light and better performance).
- **Image/scanning sensors for faster objects capture** (single-photon avalanche diode image sensor of picoseconds; CMOS sensors of charged particles, pyroelectric image sensors combining real-time acquisition and image processing).
- **Image and signal processing in sensors for machine vision** (semiconductor, photodetectors, photodiodes for VIS and IR, phototransistors, UV photodetectors, nano optoelectronic Sensors, CCD and CMOS image sensors).
- **Artificial intelligence for machine vision improvement** (deep learning, neuronal networks, support vector machines, etc.)
- **Application of sensors for 3D reconstruction** (point cloud, polygon mesh, surface models, Bezier patches, volume rendering reconstruction).
- **Application of echo signal sensors** (structural health monitoring, displacement measurement, vehicles detection, internal inspection of materials, UWB-sensors).
- **Vision-based sensory schemes**, e.g. for human-assistive systems, camera position for vehicles and robots, vision guide for automatic navigation, object recognition and manipulation, active stereoscopic view, occupancy grid for autonomous navigation, static vs dynamic triangulation schemes).
- **Novel imaging sensing modalities** for machine vision, its development and application (e.g. Microwave, Terahertz, Midinfrared, Ultrawideband, Combined, etc.)

Solicited and invited papers shall undergo the standard IEEE Sensors Journal peer review process. All manuscripts must be submitted on-line, via the *IEEE Manuscript Central™*, see <http://mc.manuscriptcentral.com/sensors>. When submitting, please indicate in the "Manuscript Type" roll down menu, and also select the "Sensors in Machine Vision of Automated Systems" Special Issue. Authors are particularly encouraged to **suggest names of potential reviewers** for their manuscripts in the space provided for these recommendations in *Manuscript Central*. For manuscript preparation and submission, please follow the guidelines in the *Information for Authors* at the IEEE Sensors Journal web page, <http://www.ieee-sensors.org/journals>

Deadlines:

- Manuscript Submission: May 31, 2020
- Notification of Acceptance: September 1, 2020
- Final Manuscript published in IEEEExplore: November 1, 2020

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