SPECIMeN Group

Sensing strategies, Perception and Characterization at Micro- and Nano-scales

AS2M Dep^t – Automatic Control and Micro-Mechatronic Systems

http://www.femto-st.fr/fr/Departements-de-recherche/AS2M/Accueil/

AS2M dep[t] multi-disciplinary research fields:
- **Automatic control,**
- **Robotics,**
- **Mechatronics,**
- **Industrial engineering.**

AS2M dep[t] research axes:
- **Micro-robotics** (micro-manipulation & assembly, characterization and biomedical appl.),
- **Control of systems at the micro-scale** (micro-robots, micro-actuators, micro-systems),
- **Prognostics & Health Management** (industrial and biological systems).

AS2M dep[t] research groups: **SPECIMeN, CODE, MiNaRoB, PHM.**

SPECIMeN group framework: **Study, development and use of specific sensing devices and information processing methods to optimize the implementation and the performances of "perception – decision – action" loops operating at micro- and nano-scales.**

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SCIENCES &
TECHNOLOGIES

Multi-scales observation for tasks automation (2D & 3D visual servoing, robust matching, local features), trade-off adustment between resolution / range measurement / bandwidth (parametric optimization of sensing), visual servoing in SEM using global features for auto-adaptative imaging, mechanical characterization of micro / nano objects and interfaces used in µrobotics.
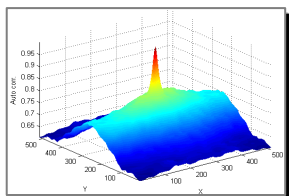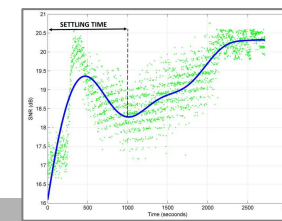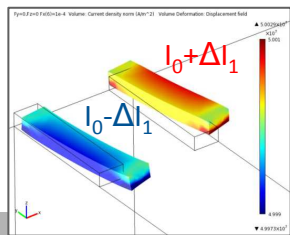
SPECIMeN scientific issues and activities

Exploitation of sensors at micro-nano scales
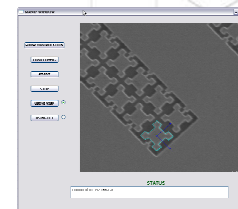
Development of sensors for micro-nano scales

Research application and projects scope

$I_0+\Delta I_1$

$I_0-\Delta I_1$

Micro-nano-force sensors design (mono & multi-DoF, elastic and rigid, low and high inertia), complete force sensing platform design, sensors modeling and calibration (SEM, micro-nanoforce sensors), sensing quality estimation (SNR estimation), defects and disturbances characterization and compensation (distorsion, drifts, vibrations).

Force sensing for multi-asperity nanotribology, electronic vision based nanopositioning, proprioceptive measurement of micro-gripper end-effectors position, low stiffness elastic microstructure characterization, multi-criteria diagnosis of human's oocytes maturity, fast scanning electron microscopy for surface acoustic waves characterization.

Head : Ass. Prof. E. Piat - 1 full prof., 2 ass. prof., 3 engineers

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