# Advanced Sensing Technologies Group

## Contact Details

<table>
<thead>
<tr>
<th><strong>Name</strong></th>
<th>Advanced Sensing Technologies Group</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Acronym</strong></td>
<td>GAST</td>
</tr>
<tr>
<td><strong>Logo</strong></td>
<td>[Logo Image]</td>
</tr>
<tr>
<td><strong>Site</strong></td>
<td><a href="http://www.gast.utcluj.ro">www.gast.utcluj.ro</a></td>
</tr>
<tr>
<td><strong>Address</strong></td>
<td>2, Observatorului Street, 5th Floor, Room 505, Cluj-Napoca, Romania</td>
</tr>
<tr>
<td><strong>Faculty</strong></td>
<td>Faculty of Automation and Computer Science</td>
</tr>
<tr>
<td><strong>Department</strong></td>
<td>Automation Department</td>
</tr>
<tr>
<td><strong>Telephone</strong></td>
<td>+40 726 362 327</td>
</tr>
<tr>
<td><strong>Director</strong></td>
<td>Prof. Dr. Eng. Daniel Moga</td>
</tr>
<tr>
<td><strong>E-mail</strong></td>
<td><a href="mailto:Daniel.Moga@aut.utcluj.ro">Daniel.Moga@aut.utcluj.ro</a></td>
</tr>
</tbody>
</table>

## Areas of Expertise

- **Smart sensors**
  - Simulation and design of optical sensors, MEMS based sensors, capacitive sensors, weather instruments
- **Wired and wireless sensor networks**
  - Ultra low power wireless sensors; Environmental monitoring with sensor networks; Multipoint wired networks
- **Hardware/software codesign for distributed control on embedded platforms**
  - Smart actuators; Fault tolerant control networks; Embedded servers and HMIs
- **Embedded hardware design for medical devices**
  - Innovative immunosensors; Monitoring in post-traumatic rehabilitation; Hyperthermic chemotherapy systems; Magnetic therapy equipment
- **Vision based monitoring and control**
  - Vision based automation systems for: quality control, automation in food industry, monitoring in agriculture

## Team

- **Prof. Dr. Eng. Daniel Moga**, Prof. Dr. Eng. Dorin Petreus, Prof. Dr. Mat. Mircea Ivan, Prof. Dr. Mat. Ion Gavrea, Prof. Dr. Ion Aurel Mironiuc, Dr. Corneliu Lungoci, Dr. Traian Oniu, Assoc. Prof. Dr. Eng. Mihai Stelian Munteanu, Assoc. Prof. Dr. Eng. Ramona Galatus, Assoc. Prof. Dr. Eng. Vlad Muresan, Assoc. Prof. Dr. Mat. Bogdan Gavrea, Assoc. Prof. Dr. Eng. Eugen Vitan, Dr. Mat. Rozica Moga, Dr. Eng. Iulia Clitan, Dr. Eng. Nicoleta Stoia, Phd. Student Eng. Zsolt Barabas

## Representative Projects

- "Hyperthermic Intra-Peritoneal Chemotherapy Equipment based on Cyber-Physical System Paradigm"
- HydroSens – "Integrated Smart Sensor System for Monitoring of Strategic Hydrotechnical Structures"
- Medical equipment for magnetic therapy with low frequency pulsed magnetic field - ATM41, PN2, 2012
- Complex architecture for monitoring and transfer of medical data. CNCSIS 1019, (2008-2010)
- Vision based systems for monitoring and intelligent control, X2C21/ 18.07.06, (2006-2008)
Significant results

The most representative publications of the past 5 years:

6. N. Cennamo; M. Pesavento; G. D’Agostino; R. Galatus; Luigi Bibbò; Luigi Zeni, “Detection of trinitrotoluene based on SPR in molecularly imprinted polymer on plastic optical fiber”, Proc. SPIE 8794, Fifth European Workshop on Optical Fibre Sensors, 879412 (20 May 2013); doi: 10.1117/12.2025695

Significant solutions:
Low cost hardware platforms for distributed sensing; Web based monitoring software for ARM platforms; Cross platform SCADA libraries; Ultra low power 8 bit embedded platform for wireless applications; Distributed control platform for building automation; Vision based mass and volume estimation for real time measurement of moving objects; CT medical image processing for computer assisted surgery

Products and technologies:
1. Distributed sensing and control platform (embedded and PC) with applications deployed in: industrial systems health monitoring, greenhouse automation, building automation
2. Smart communications hub for sensor networks, allowing data logging, processing, bridging, storing and streaming and html browser-based visualization for multiple wired/wireless sensing devices
3. Soil humidity sensors with wired/wireless interfaces
4. Weather sensors with Modbus interface
5. Condition monitoring systems for industrial machines and equipment
6. Internet based embedded platform for condition-based maintenance support
7. Vision-based equipment for high speed sorting in food industry
8. Integrated equipment for remote control and monitoring of greenhouse fields
9. Wireless system for monitoring and control of the progressive loading of lower limb in post-traumatic rehabilitation

Patents:
1. OSIM 123261 - System for Monitoring the Progressive Loading of Lower Limb in Post-Traumatic Rehabilitation, 2011
2. OSIM 122976 - System And Process For Indirectly Measuring Mass Of Objects In Motion, 2010
3. OSIM 122986 - Contactless Coupling Circuit, 2010
4. OSIM 122380 - Method And Device For Measuring Rotational Speed In Highly Disturbing Media, 2009

The offer addressed to companies

<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Consulting</td>
</tr>
</tbody>
</table>