The role of signal processing in cognitive systems and multimedia security

Carlo Regazzoni – Lucio Marcenaro
GTTI – Riunione Annuale 2012
26-06-2012
An intelligent and dynamically reconfigurable system able to adaptively regulate its internal parameters depending on the observed internal and external events.
Information technology

- Sensing - information – intelligence as central concepts
- Sensing (heterogeneous – distributed sensors / information collection)
- Communications (information transfer)
- Processing at multiple abstraction levels (intelligence)
- Cognition
  - Environmental awareness
  - Automatic learning
  - Action
Cognitive systems

- Extending capabilities of available devices
  - Cognitive radio
  - Cognitive radar
  - Cognitive surveillance
  - …
- Active devices
The Signal Processing Society is an international organization whose purpose is to:

- advance and disseminate state-of-the-art scientific information and resources
- educate the signal processing community
- provide a venue for people to interact and exchange ideas

(Adopted by SPS Board of Governors 11 September 2003)

Recent internal discussion about new name (IEEE Signal Information Processing Society)
IEEE SPS Technical Committees

http://www.signalprocessingsociety.org/technical-committees/list/

**Year 1976**
- Digital signal processing
- Digital measurement of noise
- Electroacoustic transducers
- Speech processing
- Underwater acoustics

**Year 1987**
- Audio and electroacoustics
- Digital signal processing
- Multidimensional signal processing
- Spectral estimation and modeling
- Speech processing
- Underwater acoustics
- VLSI for signal processing

**Year 2011**
- Audio and electroacoustics
- Bio imaging and signal processing
- Design and implementation of signal processing and systems
- Image, video, and multidimensional signal processing
- Information forensics and security
- Machine learning for SP
- Multimedia SP
- Sensor array and multichannel
- SP for communication and networking
- SP theory and methods
- Speech and language processing
- Industry DSP technology
- Signal processing education
# IEEE SPS Membership

<table>
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<tr>
<th>Year</th>
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<tr>
<td>1950</td>
<td>1,126</td>
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IEEE SPS Italy Chapter

- Before 2011: Joint Chapter with IEEE Aerospace Society leaded by Prof. Gaspare Galati
- October 2011: Official date for chapter starting
- Promote and foster local activities (such as conferences, meetings, social networking)
- Improve membership relations, recruiting and service to their regions
- Promote services for both academic and industrial members
- Represent their regions to the core of SPS
IEEE SPS Italy Chapter activities

- First meeting in Courmayeur (AO) in March 2012 (at the GTTI MMSP annual meeting)
- Technical sponsorship of Signal Processing in Interactive and Cognitive Environments Summer School to be held in Loano (SV) on September 2012
- Chapter Award participation
- Promote local participation of Distinguished Lecturers. Promote local speakers as DLs
- Promotion of Regional Workshops- interaction with other regional chapters
Session outline

- Internet of Things and Context Awareness: an Industrial Point of View
  - Antonio Vilei, STMicroelectronics
- Industrial applications and international activities concerning Software Defined Radio and Cognitive Radio
  - Marco Cesena, Selex Elsag
- Dynamic Sensor Selection for Cognitive Radar Tracking
  - Fulvio Gini, University of Pisa
- Multimedia security: trends, challenges and opportunities
  - Francesco De Natale, University of Trento and Mauro Barni, University of Siena