# IEEE Systems, Man, and Cybernetics Society's Perspectives and Brain-Related Technical Activities

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# Three Broad Categories that Span IEEE

- Development of:
  - novel methods for brain measurements
  - improved algorithms for data analysis and modeling
  - novel approaches for brain-computer interfaces

# SMC at the Center of the BMI Loop
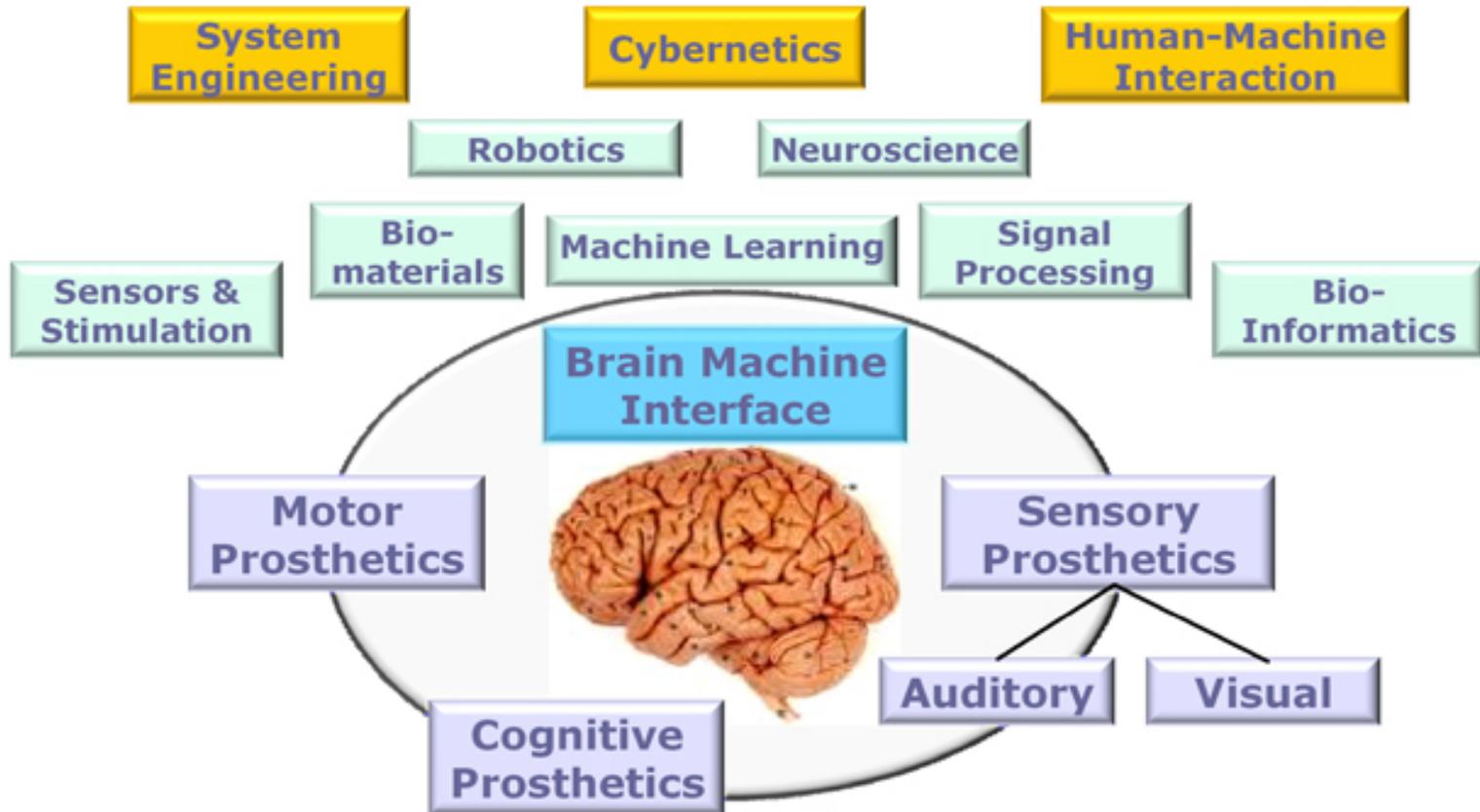


Message: There are many new research opportunities for both bio-medical and non-biomedical engineers as well as other researchers.
Collaborate!

# SMCS 50+ Technical Committees

| Systems | Human-Machine Systems | Cybernetics |
|---------|----------------------|-------------|
| Conflict Resolution | Biometrics and Applications | Awareness Computing |
| Cyber-Physical Cloud Systems | **Brain-Machine Interface Systems** | **Big Data Computing** |
| Discrete Event Systems | Cognitive Computing | Computational Collective Intelligence |
| **Distributed Intelligent Systems** | Computer Supported Cooperative Work in Design | Computational Cybernetics |
| Enterprise Architecture and Engineering | Environmental Sensing, Networking and Decision-Making (ESND) | Computational Intelligence |
| Enterprise Information Systems | Human Centered Transportation Systems | Computational Life Science |
| Grey Systems | **Human-Computer Interaction** | **Cybernetics for Cyber-Physical Systems** |
| Homeland Security | Human Perception in Multimedia Computing | Diagnostics and Prognostics |
| Infrastructure Systems and Services | Information Systems for Design and Marketing | Evolving Intelligent Systems |
| Intelligent Green Production Systems | **Interactive and Wearable Computing and Devices** | Granular Computing |
| Intelligent Learning in Control Systems | **Shared Control** | Information Assurance & Intelligent Multimedia-Mobile Communications |
| Intelligent Power and Energy Systems | Visual Analytics and Communication | Intelligent Industrial Systems |
| Intelligent Transportation Systems | | Intelligent Internet Systems |
| Logistics Informatics and Industrial Security Systems | | Intelligent Vehicular Systems & Control |
| **Medical Mechatronics** | | Knowledge Acquisition in Intelligent Systems |
| Model-Based Systems Engineering | | **Machine Learning** |
| **Robotics and Intelligent Sensing** | | Medical Informatics |
| Service Systems and Organization | | **Pattern Recognition** |
| System of Systems | | Soft Computing |
| **Systems Biology** | | |

# SMCS BMI Workshops: 2009-2016

- Six annual Workshops on Brain Machine Interfaces:
  - Part of annual SMCS conference (~1,000 delegates): most are non-biomedical experts, many interested in BMI.
  - Workshop attendees 75-200
    (CASS and EMBS co-sponsored 2011 workshop)
  - Tutorials
  - Invited speakers
  - Panels
  - Papers
  - Networking receptions
- Workshops are over 4 days and include 1 day tutorials
- Next workshop: Budapest, Hungary, October 9-12, 2016

# How SMCS Can Contribute to IEEE Brain Initiative?

- Invite the IEEE Brain Initiative and other S/Cs to be technical co-sponsors of our BMI Workshop at SMC 2016 in Budapest, October 9-12, 2016
- Host a meeting of all S/C representatives to the IEEE Brain Initiative Workshop in Budapest
- Invite submissions to annual International Winter Conference on Brain-Computer Interface that SMC Society co-sponsors
- Open to co-sponsoring a new journal
- Appoint an SMCS Distinguished Lecturer to deliver lectures at other brain-related events and encourage collaboration
- SMSC is open to collaboration and involvement with other Brain Initiative activities that will serve our membership