

IEEE Transactions on Fuzzy Systems

Special Issue on Cyborg Intelligence: Human Enhancement with Fuzzy Sets

Deadline for Submissions – 30 September 2021

1. Aim and Scope

Well-known scientists and experts have expressed concern that robots may take over the world. More generally, there is concern that robots could take over human jobs and leave billions of people suffering long-term unemployment. Yet, such concerns ignored the potential of intelligence techniques to enhance the natural capabilities of human beings with in-the-body technologies and so become cyborgs with superior capabilities to robots. Cyborg intelligence is dedicated to improving the natural capabilities of human beings by integrating AI with biological intelligence and in-the-body technologies through tight integrations of machines and biological beings. The most critical challenges of cyborg intelligence include information fusion in sensory-motor integration, cognitive computational models, fuzzy control of cyborg systems, and related topics. Among these issues, fuzzy logic is a high-efficiency problem-solving control system that imitates the way people solve problems under uncertain, ambiguous, noisy, and even missed input information. Besides, the fuzzy logic system can use all the input and output data needed in processing. The key idea with the fuzzy logic is that inputs are taken from sensors having a certain value and transformed into membership values varying from 0 to 1. Recent theoretical developments on fuzzy sets provide novel perspectives for the key mechanisms of decision making and information processing in cyborg systems.

The goal of this special issue is to promote human enhancement with fuzzy systems through the theoretical frameworks of cyborg intelligence and publish frontier research and practical applications, which are concerned with hybrid fusion of organic and biomechatronic body parts with the integration of technologies including sensing, cognition, and fuzzy control across or between machines, humans, and organizations, where the sensing data should be comprehensively analyzed to help the robot take corresponding decisions concerning its position or other movements, and the fuzzy logic system is used for the artificial intelligence control algorithm of the cyborgs. Furthermore, the combination of new technologies, efficient scientific and engineering solutions, visions for future research, and the development of cyborg intelligence with fuzzy systems will also be provided.

With the rapid development of bionic technology, it is believed cyborg intelligence can assist humans to conquer many natural limitations such as disability, speed, strength, as well as intelligence. However, many challenges will still lie ahead. Thus, this special issue serves as an essential and timely update on this topic and should be of interest to potential readers.

2. Topics Covered

The lists of possible topics include, but are not limited to:

- Fuzzy-based augmented cognition and decision making on cyborg intelligence
- Fuzzy mechanisms for learning approaches and data-driven approaches to cyborg systems
- Computational intelligence methods via fuzzy logic (Energy-efficient optimization problem) with applications to cyborg systems
- Fuzzy-based sensing, fusion, and features extraction on cyborg intelligence
- Human-In-the-loop fuzzy control in human-centered cyborg systems
- Fuzzy control theory through extensions of ordinary fuzzy sets on cyborg control
- Applications of fuzzy-based cyborg intelligence on rehabilitation robotics, prosthesis and exoskeleton robotics, medical and surgical robots, biomimetic robots

3. Submission Guidelines

All authors should read 'Information for Authors' before submitting a manuscript at

<http://cis.ieee.org/ieeetransactions-on-fuzzy-systems.html>

Submissions should be through the IEEE TFS journal website <http://mc.manuscriptcentral.com/tfs-ieee>.

Submissions should also be in the **correct format**

<https://journals.ieeeauthorcenter.ieee.org/create-your-ieee-journal-article/authoring-tools-and-templates/tools-for-ieee-authors>

It is essential that your manuscript is identified as a Special Issue contribution:

- Ensure you choose 'Special Issue' when submitting.
- A separate cover letter must be included which includes the title 'Special Issue on Cyborg Intelligence: Human Enhancement with Fuzzy Sets'

4. Important Dates

- **30 September 2021: Submission deadline**
- January 2022: notification of first round of reviews (for guidance only)
- May 2022: revised submissions due (for guidance only)
- September 2022: Final notice of acceptance/rejection (for guidance only)

5. GUEST EDITORS

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