

Call for Papers
IEEE Transactions on Cognitive and Developmental Systems
Special Issue on
Prediction and Perception in Humans and Robots

I. AIM AND SCOPE

This Special Issue addresses perceptual optimization processes related to attentional and predictive mechanisms. Optimal interaction with the environment requires that agents learn to anticipate and evaluate which sensory information is relevant so as to prioritize its processing. It has been suggested that, during perception, the selection of sensory information depends on predictive mechanisms that have modulatory effects, enhancing/facilitating, or attenuating/cancelling sensory signals. These processes are usually referred to as perceptual optimization processes.

Scientific production on topics such as internal models, predictive processing, prediction error minimization, sensory attenuation/cancellation, sensory enhancement/facilitation has been increasing in the cognitive science literature during the last decade. Still, there is not a consensus on the role of perceptual optimization processes during learning, action and perception, and on how they influence motor and cognitive development. Several empirical contradictions and theoretical controversies can be found in the cognitive science literature regarding these processes. Moreover, the modelling of perceptual optimization processes in artificial agents and cognitive architectures, especially in the context of multi-modal integration, cross-modal interactions, and continual learning, is very limited. The full potential of applying these processes into robotics has yet to be released.

II. THEMES

Experimental research, robotics implementations, and interdisciplinary works are particularly welcome, as well as theoretical contributions in the form of original research articles, reviews, and commentaries. This special issue invites researchers investigating topics related, but not limited, to:

- Attentional and gating mechanisms for action and sensory information processing
- Context- and task-dependent perceptual optimization
- Sensory attenuation/cancellation and sensory enhancement/facilitation
- Interplay of predictive and attentional mechanisms for prediction error minimization
- Multimodal integration and/or cross-modal interactions
- State representation learning
- Constrained innate priors that drive learning

- Prediction in language learning and comprehension
- Prediction error dynamics monitoring
- Dreaming, non-conscious perception, hallucination, altered perceptual phenomena

III. SUBMISSION

Manuscripts should be prepared according to the “Information for Authors” of the journal found at: <https://cis.ieee.org/publications/t-cognitive-and-developmental-systems/tcds-information-for-authors> Submissions should be done through the IEEE TCDS Manuscript center: <https://mc.manuscriptcentral.com/tcds-ieee>. Please select the category “SI: Prediction and Perception in Humans and Robots”.

IV. IMPORTANT DATES

Paper submission deadline - 15 July 2021
Notification to authors - 15 September 2021
Deadline revised papers submission - 15 November 2021
Final version - 15 December 2021

V. GUEST EDITORS

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