

IEEE Control Systems Letters (L-CSS)

Call for submissions to L-CSS Special Issue: "Learning and control"

The L-CSS invites submissions for a **special issue** on "**Learning and control**" (to be included, tentatively, in the June 2020 issue of L-CSS).

Authors are invited to submit **six-page** manuscripts for review on this topic. The deadline for initial submissions is: **December 10, 2019**.

Submission for the special issue will be possible starting on **November 10, 2019**.

Submission instructions can be found in the L-CSS website at

http://ieeecsletters.dei.unipd.it/Page_authors.php?p=1

Guest Editors:

- **Giovanni Cherubini**, IBM Research, Zurich, Switzerland
- **Martin Guay**, Queen's University, Canada
- **Sophie Tarbouriech**, LAAS-CNRS, Toulouse, France

Recent progress in machine learning has provided performance gains in several fields, in particular when massive data and large amounts of computing are needed. Similarly, modern control theory techniques have found application for the analysis and control design of complex dynamical systems (that is combining models of different nature like ODE, PDE, logics, hybrid, ...). The connection between machine learning and control theory is more and more pertinent in view of surpassing the potentialities of each discipline. For example, distributed adaptive control has been proposed as a modeling framework for integrating heterogeneous elements of artificial intelligence and machine learning into systematic cognitive architectures.

Control design for dynamical systems involving changing environments, hard nonlinearity, stochastic effects, unknown or unmodeled dynamics, uncertainty or still large dimension, remains an open research topic. It appears then very challenging to extend control theoretic approaches to models that are unavailable or difficult to obtain, possibly affected or built with large amount of data, by adding machine learning and deep learning ingredients in the loop.

This special issue intends to collect new ideas and contributions at the frontier between the fields of control and machine learning theory for dynamical systems. The primary aspect of any contribution should be novelty and originality. Also, the results should be presented in a mathematical language, according to the L-CSS standard.

Specific topics of interest for this special issue include, but are not limited to:

- stability, robustness, performance issues of dynamical systems including machine learning elements in the loop;
- identification, observation and approximation techniques of dynamical systems including machine learning elements in the loop;
- reinforcement learning for control;
- data-driven control including learned models;
- adaptive control for cognitive architectures.

A manuscript submitted to the special issue should be **six pages long** in the journal format (style files are available on [PaperPlaza](#)), which is a strict limit.

The contribution may also be accompanied by **supplementary material**, as is customary in biology journals (up to 9 additional pages are possible). However, according to the journal policy, **the value of the submission shall be decided based only the main paper**, which must be self-contained, namely, the results can be understood and checked without reading the supplement.

The supplement is intended to present complementary information, such as simulations, videos, figures, or examples, but not, for instance, theorem proofs or definitions. Some mathematical background can be added to the supplement, for the reader's convenience, if it is already existing in the literature. However, crucial new derivations must be in the main paper.

The manuscripts will be peer-reviewed by international experts. According to the L-CSS policy, the final decision will be made within two rounds of reviewing with no exceptions. The final decision will be reached no later than 5 months from the initial submission deadline.

Important dates

Submission deadline: December 10, 2019.

(Accepted) Papers online publication: within one week from the submission of the final manuscript and in any case no later than 6 months after initial submission.