

Call for Papers
Special Issue on Human-Centered Automation
IEEE TRANSACTIONS ON AUTOMATION SCIENCE AND ENGINEERING

The growing prevalence and scope of automation is evident not only large-scale infrastructure (nextGen transportation systems, aircraft flight management systems, smart grid technologies), but also in small-scale and consumer products (Google Car, the PR2, Nest). Automation encompasses not only simple, repetitive tasks, but also many sophisticated functionalities. However, even in systems in which automation has replaced functionality previously performed by humans, the human is still a central player. As automation becomes “smarter” and more ubiquitous, it is paramount that the human interact with the controlled systems in a safe and efficient way, to help prevent problems in human-automation interaction. In recent years, advances have been made in understanding the behavior of systems with humans and automation: techniques have been developed to enhance situational awareness, to develop a common operating picture across multiple users, and to build predictive models of human behavior in different contexts. However, significant work remains to be done in the development of core scientific and engineering principles in human-automation systems. Analysis and design principles and metrics are needed to guide the design of human-centered control paradigms for semi-autonomous systems. The central theme of the proposed special issue is *tools and methods for the design and analysis of human-centered automation systems*.

Articles in the special issue will focus on generalizable techniques for human-centered automation, as opposed to narrow case studies. Applications may be within or across a wide range of disciplines and physical scales, including biomedical devices, driver assistance systems, aircraft flight management systems, smart buildings, decision aids in supervisory systems, air traffic systems, and others. Novel contributions are sought that may include, but are not limited to:

- the design and validation of computational models of a system which integrate models of the human with models of autonomous and semi-autonomous systems, such as systems which infer intent of a human operator;
- the design of systems which ease the exchange of information between humans and autonomous systems;
- the analysis and prediction of potential conflicts between the human and the automation;
- the design of autonomy to accommodate varying levels of human experience, training, and acuity;
- the analysis of information asymmetry in collaborative, semi-autonomous systems;
- the design of autonomy for off-nominal conditions, such as multiple sensor failures, human error, or other cascading events;
- the design of autonomy to support systems with multiple humans;
- the design of autonomous systems which are “self-aware”, so that humans are prompted to intervene when required.

Deadlines: Submission: February 15, 2015. Acceptance notification: Sept. 2015. Publication: Jan. 2016.

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Submission Details: All papers submitted to the special issue will be subject to peer review in accordance with the established practices of the IEEE Transactions on Automation Science and Engineering. Papers that do not fall within the scope of the special issue will be returned to the authors without review, to enable submission as regular papers through the normal channels. Prospective authors are invited to submit their manuscripts by following the guidelines described at <http://mc.manuscriptcentral.com/t-ase>. Hardcopy submissions will not be accepted.