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Supervisory Control of Discrete Event Systems: A Retrospective and Two Recent Results on Privacy and Security



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ABSTRACT: We start with a brief retrospective of the theory of supervisory control of discrete event systems, initiated in the seminal work of Ramadge & Wonham over 30 years ago, and compare it with recent work on formal methods in control. We then present results from our group on two problems: (i) obfuscation of system secrets by insertion of fictitious events in the output stream of the system; and (ii) sensor deception attacks in the supervisory control layer of a cyber-physical system. In each case, we describe our solution procedure, which is based on synthesizing a discrete game structure that embeds all valid solutions.

BIO: Stéphane Lafortune is a professor in the Department of Electrical Engineering and Computer Science at the University of Michigan. He obtained his degrees from École Polytechnique de Montréal (B.Eng), McGill University (M.Eng), and the University of California at Berkeley (PhD), all in electrical engineering. He is a Fellow of IEEE (1999) and of IFAC (2017). His research interests are in discrete event systems and include multiple problem domains: modeling, diagnosis, control, optimization, and applications to computer and software systems.



Questions? Contact: Judi Jones asap@umich.edu