Stochastic Adaptive Control - Its Central Role in Interdisciplinary Research

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Stochastic adaptive control is presented as a field that spans all STEM++. This is multidisciplinary and interdisciplinary research. Stochastic adaptive control is about the control of a partially known stochastic system. While stochastic models are developed from physical systems, typically some parameters of the model are unknown but the systems have to be controlled. A solution to it consists of parameter estimation and control. The noise processes for these stochastic models include some that have been empirically identified in cognition, that is, fractional Brownian motions. Stochastic control and stochastic adaptive control problems are described for systems with a noise modeled by fractional Brownian motions and other non-Gaussian stochastic processes. Applications of stochastic systems and control include telecommunication, biomedicine, and finance. The methods from theoretical aspects of stochastic adaptive control have been also applied to the educational research project based learning/teaching in STEM.

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