

Some Thoughts on Online Parameter Identification

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Abstract:

Online or real time parameter identification is the task of inferring model parameters simultaneously to the process of data sensing of a dynamical system in operation. Online parameter identification finds its major application in the adaptive control of dynamical systems such as airplanes or power plants in order to ensure their safe and efficient operation. Given its relation with the Kalman filter, online parameter identification is also used in the context of data assimilation problems characterized by high computational costs and enduring arrival of measurements. In this talk, we illustrate key concepts of online parameter identification by means of linear and finite dimensional problems. After that, we present online identification strategies that aim at parameters in time-dependent and possibly nonlinear partial differential equations. We conclude our presentation by pointing to theoretical and computational challenges in the field.