

1983b

“A Doubly Recursive Algorithm for System Identification from Non-Stationary Cross-Sectional Data,” D. W. Porter, M. D. Shuster, and W. S. Levine, *Proceedings, American Control Conference*, San Francisco, California, June 22–24, 1983, pp. 1257–1261.

This is the first of three conference reports on the development of efficient maximum-likelihood-estimation techniques for the identification of large-scale dynamical systems. The work treated not only biases but error-level covariance matrices and Markov parameters (time constants and power spectral densities). The work has been applied successfully to systems with several hundred biases and nearly 100 Markov parameters, systems whose analysis often exhausted the capabilities of the main-frame computers then available.

The general methodology was to separate the estimation process into two steps. In the first step, the time-series of measurements for a given test were solved for the Markov parameters and initial conditions, taking advantage of the Gupta-Mehra formalism. The initial conditions for the different tests (the cross-sectional data) were then used to estimate the initial condition parameters.

This technique has been used also in sensor alignment estimation (1990a, 1997a and 2003g).

Succeeded by 1983e, 1984b.