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Modeling, Estimation and Control of the Anaesthesia Process¹

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Highlights

- A mathematical model for the drug distribution and drug effect of intravenous anaesthesia was discussed.
- Different estimation techniques have been designed, implemented and tested: Kalman filter, offline moving horizon estimation and online moving horizon.
- The state estimators have been implemented simultaneously with mp-MPC and simulated comparatively in the induction and maintenance phases of intravenous anaesthesia, both with and without noise influencing the output.
- The developed strategies successfully address two of the main challenges in the control of the intravenous depth of anaesthesia: nonlinearity and inter-and intra- patient variability.

¹ A tribute to Prof. Rafiq Gani for his intellectual leadership in Process Systems Engineering

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