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From Theory to Practice: Incremental Nonlinear Control

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Deadline for manuscript submissions:
closed (31 January 2025)

Message from the Guest Editors

Dear Colleagues,

Nonlinear incremental control is a branch of control methods that utilize a data-driven incremental model. It exploits sensor measurements online and can simultaneously reduce controller model dependency and robustness. The word incremental means the controllers are designed considering the variations of state, control, and control derivatives in one incremental time step. These nonlinear incremental control methods have also found their broad applications in various practical fields including, aerospace, robotics, and mechanical systems.

This Special Issue aims to welcome contributions to the theoretical and practical perspectives of incremental control, including but not limited to the following:

- Stability analysis;
- Robustness analysis;
- Novel controller design based on an incremental model;
- Novel applications of nonlinear incremental control.

Dr. Erik-Jan Van Kampen
Dr. Xuerui Wang
Guest Editors

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Message from the Editorial Board

We are just entering the Next Wave of Technology (NWT) where actuators will play the same role as the computer chip did for computers/social media approximately four decades ago. Just in the U.S., production of $1 trillion year of electromechanical systems (vehicles, orthotics, manufacturing cells, freight trains, aircraft, etc.) will be impacted by the NWT, all driven by actuators. Five key trends can be found for the future perspectives: “Performance to Reliability”, “Hard to Soft”, “Macro to Nano”, “Homo to Hetero” and “Single to Multi functional”. We invite papers that primarily impact these economic sectors; those illustrating basic scientific principles are also welcome.

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