# Article information:

Improving the performance of UDE-based controller using a new filter design | SpringerLink
<https://link.springer.com/article/10.1007/s11071-014-1337-x>

# Article summary:

1. This article discusses the use of a new filter design to improve the performance of UDE-based controllers.

2. The proposed filter is used to estimate uncertainties and disturbances in order to achieve robustness for nonlinear systems.

3. Simulation and comparison results are presented to demonstrate the efficacy of the design, applied to a wing-rock motion control problem.

# Article rating:

Appears well balanced: The article presents the information in a reliable and balanced way, without biases and prejudices. The claims made in the article are well supported and, where applicable, all sides of the argument are given opportunity to present their point of view. The article appears trustworthy and reliable.

# Article analysis:

The article provides an overview of the concept of uncertainty and disturbance estimation and compensation, as well as various techniques that have been developed for this purpose. It then introduces a novel approach based on UDE, which has been used in various applications such as attitude control of spacecrafts, vibration suppression, trajectory tracking control of rigid link manipulators, and so on. The article then proposes a new filter design to improve the performance of UDE-based controllers when faced with fast-varying uncertainties and disturbances. The closed-loop stability analysis is presented to show that by employing the proposed filter in the UDE formulation, errors can be kept within acceptable limits by choosing the design parameter appropriately. Simulation and comparison results are provided to demonstrate the efficacy of the design when applied to a wing-rock motion control problem.

The article appears to be reliable and trustworthy overall; it provides detailed information about various approaches for uncertainty estimation, as well as an overview of how UDE has been used in different applications. Furthermore, it presents a clear explanation of how its proposed filter design works and provides evidence through simulation results that it can effectively improve controller performance when faced with fast-varying uncertainties and disturbances. There does not appear to be any bias or one-sided reporting in this article; all relevant points are discussed thoroughly without any unsupported claims or missing points of consideration being made. Additionally, there is no promotional content or partiality present in this article; all arguments are presented objectively without any attempt at persuasion or manipulation. Finally, possible risks associated with using UDE are noted throughout the article; thus providing readers with an informed understanding before attempting implementation themselves.

# Topics for further research:

* UDE-based controller design
* Robust control of uncertain systems
* Attitude control of spacecrafts
* Vibration suppression techniques
* Trajectory tracking control of rigid link manipulators
* Closed-loop stability analysis of UDE-based controllers

# Report location:

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