# Article information:

Data-Driven model identification and efficient MPC via quasi-linear parameter varying representation for ORC waste heat recovery system - ScienceDirect  
<https://www.sciencedirect.com/science/article/pii/S0360544223003535>

# Article summary:

1. This article discusses the use of data-driven model identification and efficient MPC via quasi-linear parameter varying representation for ORC waste heat recovery systems.

2. The Koopman operator is used to obtain a data-driven velocity-based QLPV model of the ORC based WHR system, and an online updating mechanism is proposed to improve the prediction accuracy of the model.

3. The control performance of the QLPV-IMPC based on the proposed data-driven QLPV model is compared to that of the traditional NMPC, and simulation results show its advantages and effectiveness.

# Article rating:

May be slightly imbalanced: The article presents the information in a generally reliable way, but there are minor points of consideration that could be explored further or claims that are not fully backed by appropriate evidence. Some perspectives may also be omitted, and you are encouraged to use the research topics section to explore the topic further.

# Article analysis:

The article “Data-Driven Model Identification and Efficient MPC via Quasi-Linear Parameter Varying Representation for ORC Waste Heat Recovery System” provides a comprehensive overview of how data-driven models can be used to identify and control organic rankine cycle (ORC) waste heat recovery systems. The authors present a novel approach using Koopman operator theory to obtain a data-driven velocity-based quasi linear parameter varying (QLPV) model, as well as an online updating mechanism to improve prediction accuracy. They then compare the control performance of their proposed QLPV-IMPC strategy with that of traditional nonlinear MPC methods, showing its advantages in terms of easy implementation and reduced online computation time.

The article is generally well written and provides a thorough overview of its topic, making it suitable for readers with some prior knowledge in this field. It also includes several references to relevant literature which adds credibility to its claims. However, there are some potential biases in the article which should be noted. For example, while it does mention some potential drawbacks associated with traditional PID controllers, it does not provide any evidence or counterarguments for why they may still be suitable in certain cases or applications. Additionally, while it does discuss other approaches such as linear time invariant models and adjoint based controllers, these are not explored in detail or compared against each other or against the proposed method. This could lead readers to believe that the proposed method is superior without considering all possible alternatives or their respective merits and drawbacks.

In conclusion, this article provides a comprehensive overview of how data driven models can be used for identifying and controlling ORC waste heat recovery systems using Koopman operator theory and quasi linear parameter varying (QLPV) models. While generally well written and informative, there are

# Topics for further research:

* Adjoint based control
* Linear time invariant models
* ORC waste heat recovery systems
* PID controller drawbacks
* Koopman operator theory
* Quasi linear parameter varying (QLPV) models

# Report location:

<https://www.fullpicture.app/item/5dcf23762415a3cebe8d425191e356fe>