

Detection and Mitigation of Corrupted Information in Distributed Model Predictive Control Based on Resource Allocation

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① Motivation

The Basic Problem That We Studied
Previous Work

② Our Results/Contribution

Main Results
Basic Ideas for Proofs/Implementation



Outline

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Make Titles Informative. Use Uppercase Letters.

Subtitles are optional.

- Use itemize a lot.
- Use very short sentences or short phrases.



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You can create overlays. . .

- using the pause command:
 - First item.
 - Second item.
- using overlay specifications:
 - First item.
 - Second item.
- using the general uncover command:
 - First item.
 - Second item.



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Summary

- ① Resource allocation based DMPC is vulnerable to attacks.
 - ② Sub-problems structure has time invariant parameters.
 - ③ Attack can be estimated using these parameters.
- Outlook
 - Inequality Constraints yield Hybrid behavior
 - Non-linear attack model
 - Repository
<https://github.com/Accacio/SysTol-21>



For Further Reading I

-  P. Velarde, J. M. Maestre, H. Ishii, and R. R. Negenborn, “Scenario-based defense mechanism for distributed model predictive control,” in *2017 IEEE 56th Annual Conference on Decision and Control (CDC)*. IEEE, Dec 2017, pp. 6171–6176.
-  J. M. Maestre, R. R. Negenborn *et al.*, *Distributed Model Predictive Control made easy*. Springer, 2014, vol. 69.
-  A. Author.
Handbook of Everything.
Some Press, 1990.
-  S. Someone.
On this and that.
Journal of This and That, 2(1):50–100, 2000.