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# Coalitional Distributed MPC

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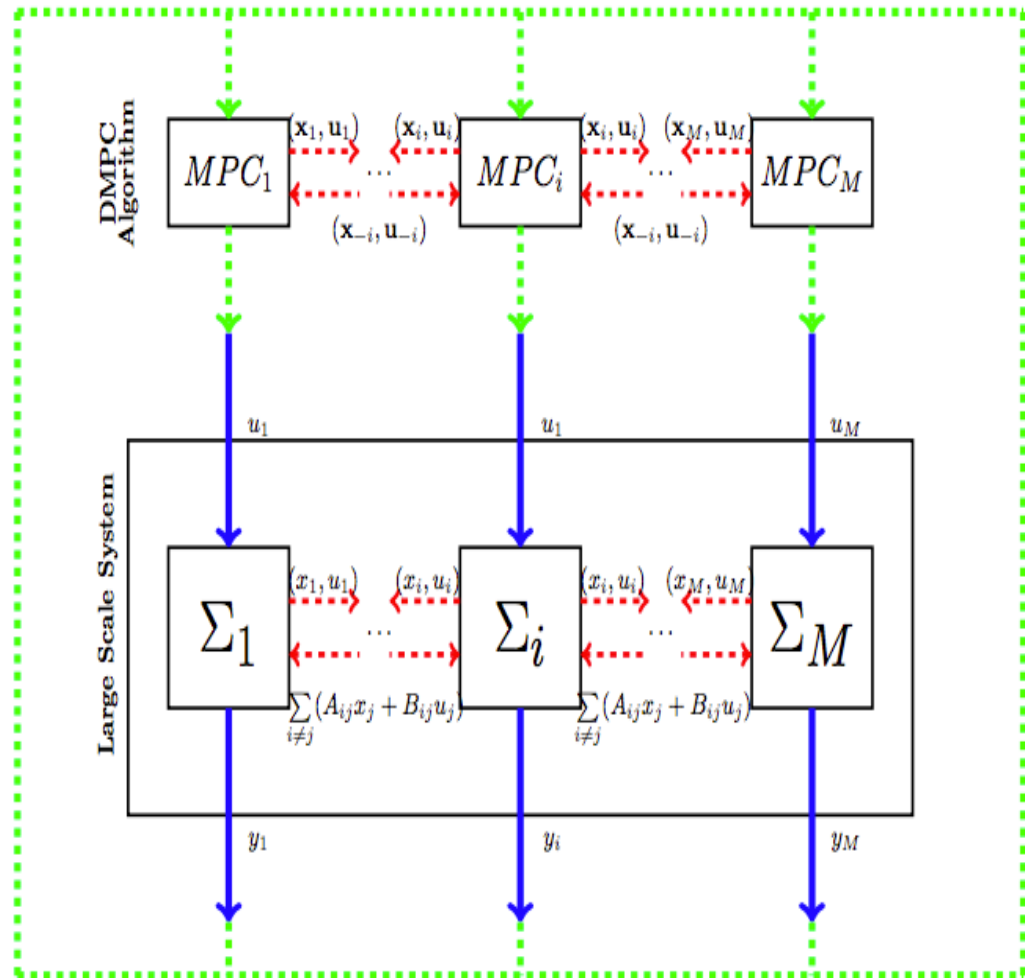
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*UKACC PhD Presentation Showcase*



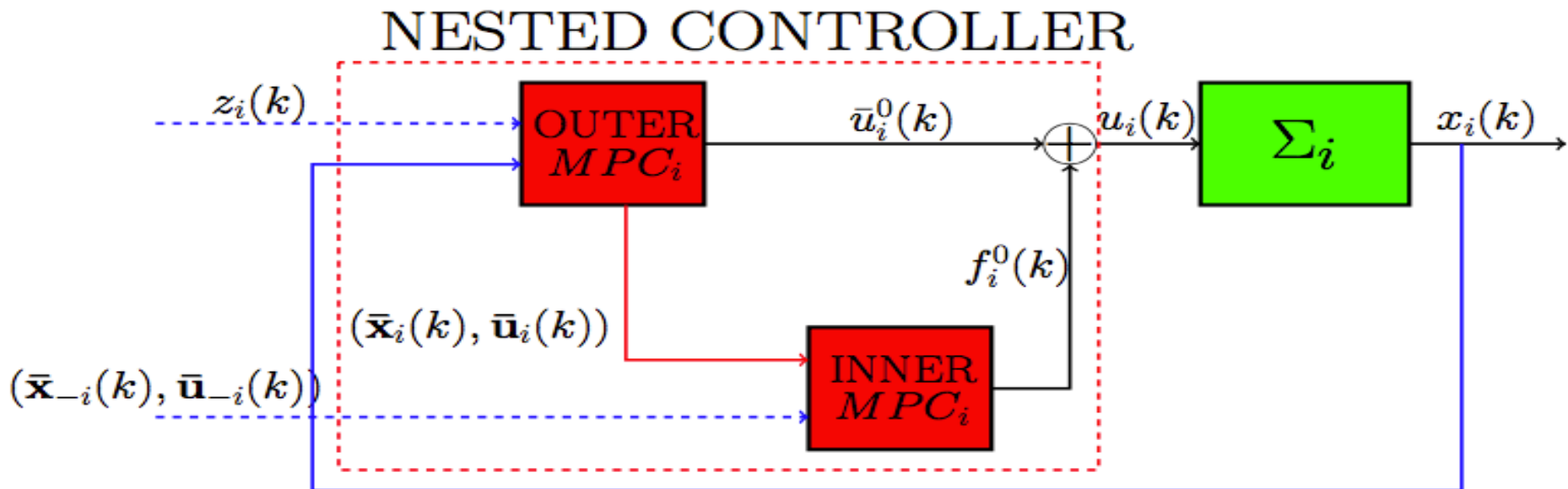
# Introduction and Motivation

- Interest in controlling larger and more interconnected systems.
- Centralised control undesirable.
- Distributed controller.

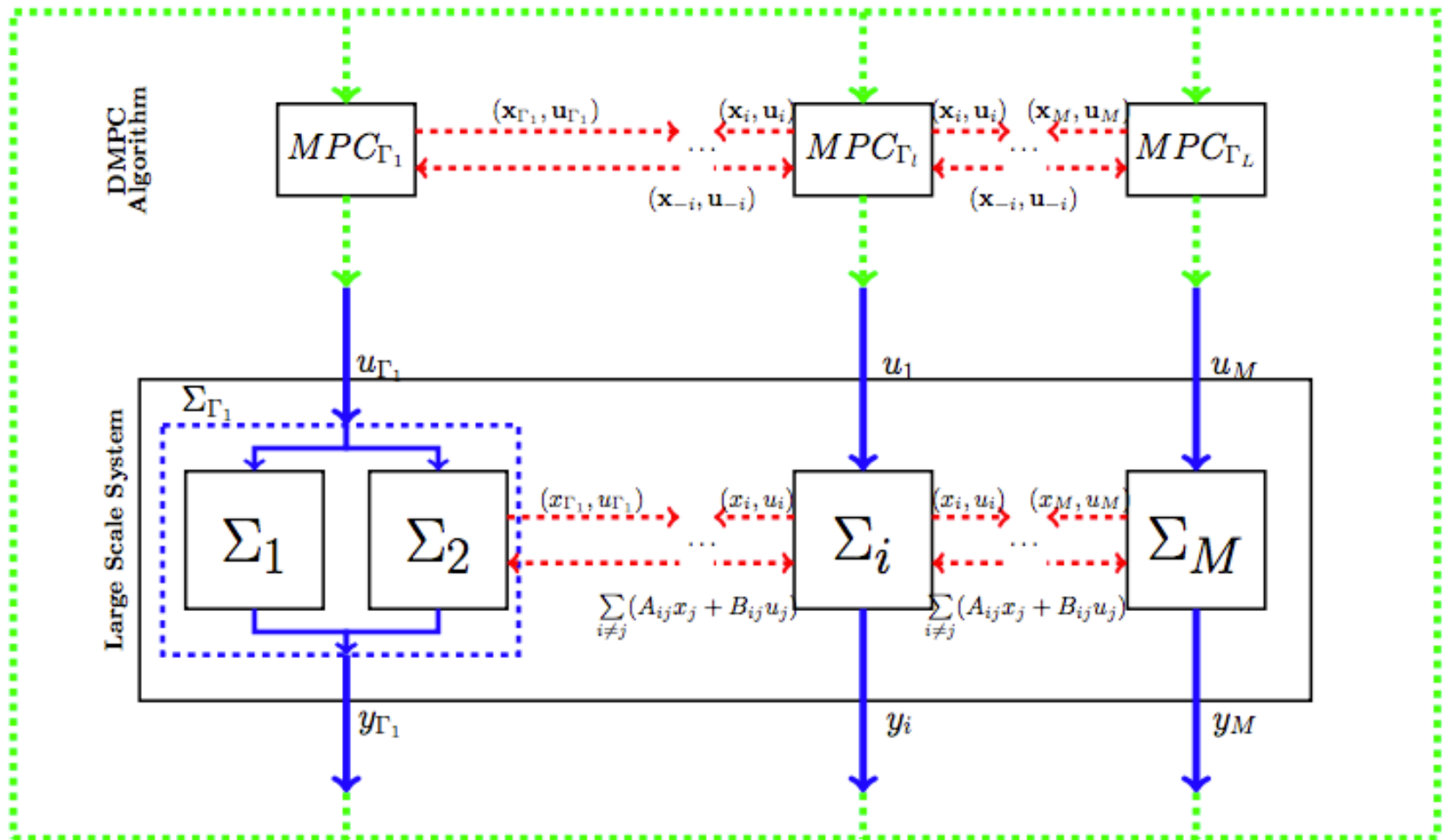


# DMPC for high dimensional sub-systems

- Two layer controller:
  - Outer layer: Optimises trajectories
  - Inner layer: Rejects mutual disturbances



# Coalitional DMPC: grouping controllers



# Switch between coalitions over time!

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- Coalitional control implies switching systems.
- A careful switching law is needed.
- Research challenge: timing of coalition switch.



# Summary and Future work

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## ➤ Advances so far

- *Robust DMPC for high dimensional subsystems.*
- *Remove explicit invariant set computations.*
- *Coalitional control based on game theory.*

## ➤ Future work

- *Theoretical properties of coalitional systems.*
- *Extend framework to plug-n-play control.*

