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Robotics: Fleets

Area 2 – Technologies

Lesson 7 – Robotics

Sequence ID – 25

CSIC





DISCLAIMER

A2.L7.T3 Robotics: Fleets

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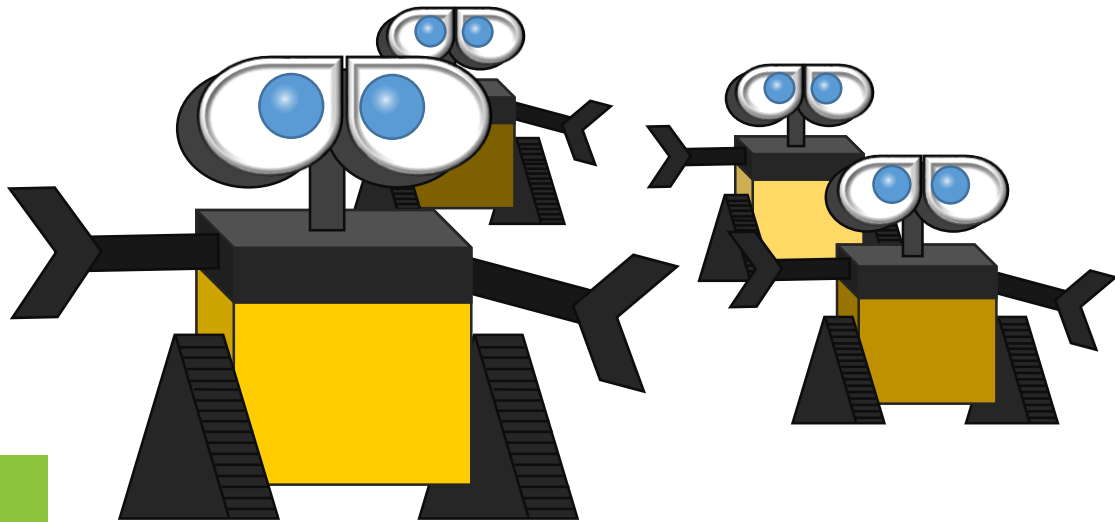
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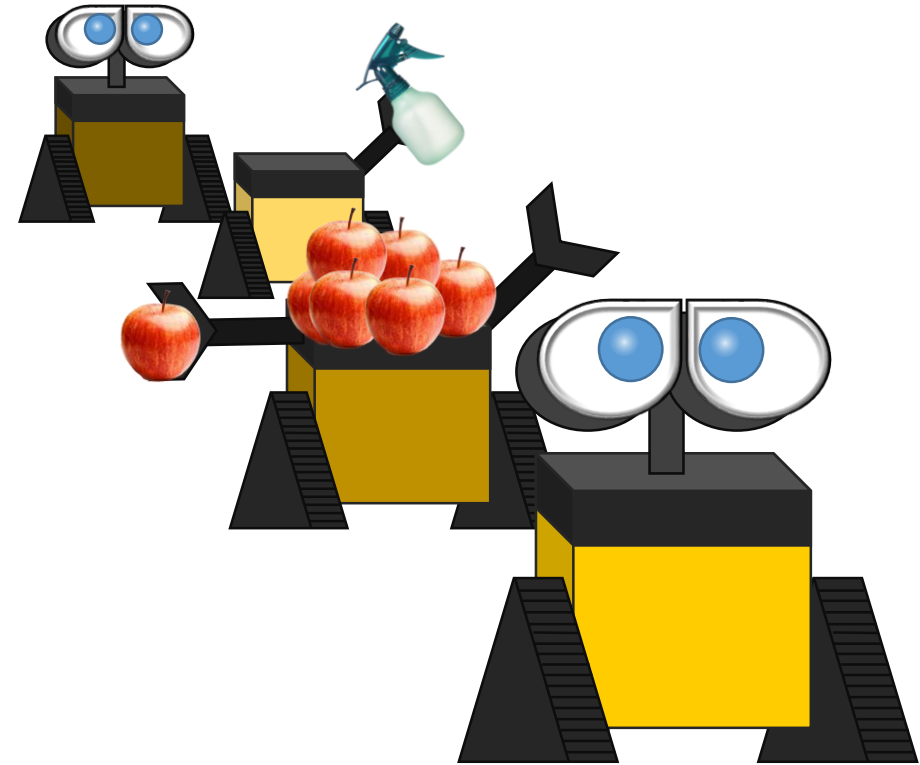
Types of Fleets



- Homogeneous

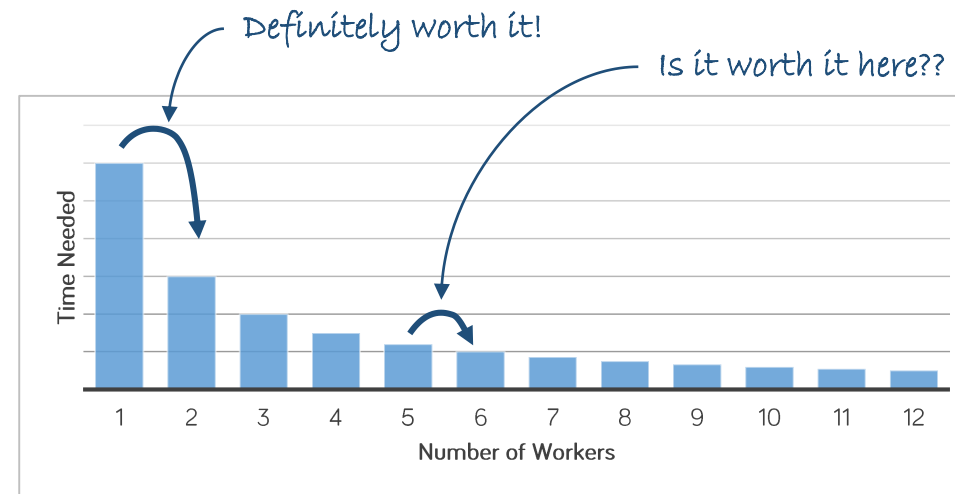
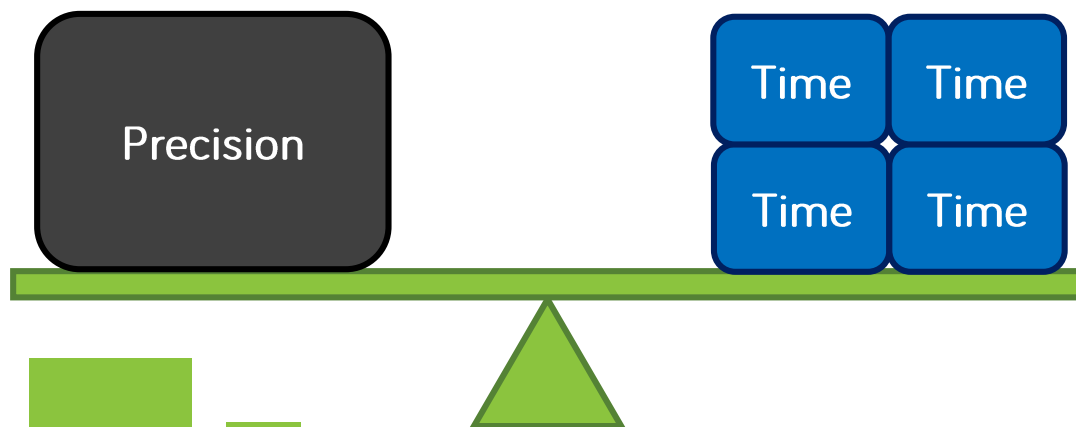
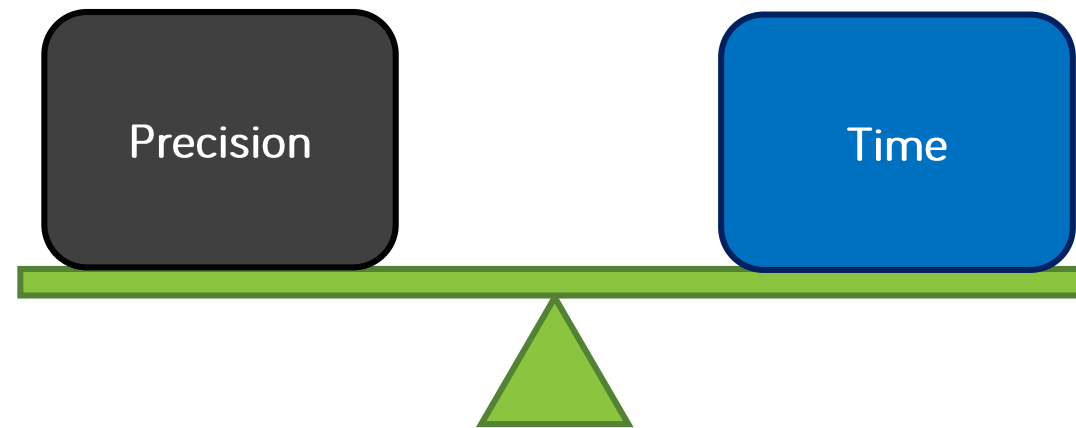


- Heterogeneous



Why Fleet Operation?

①



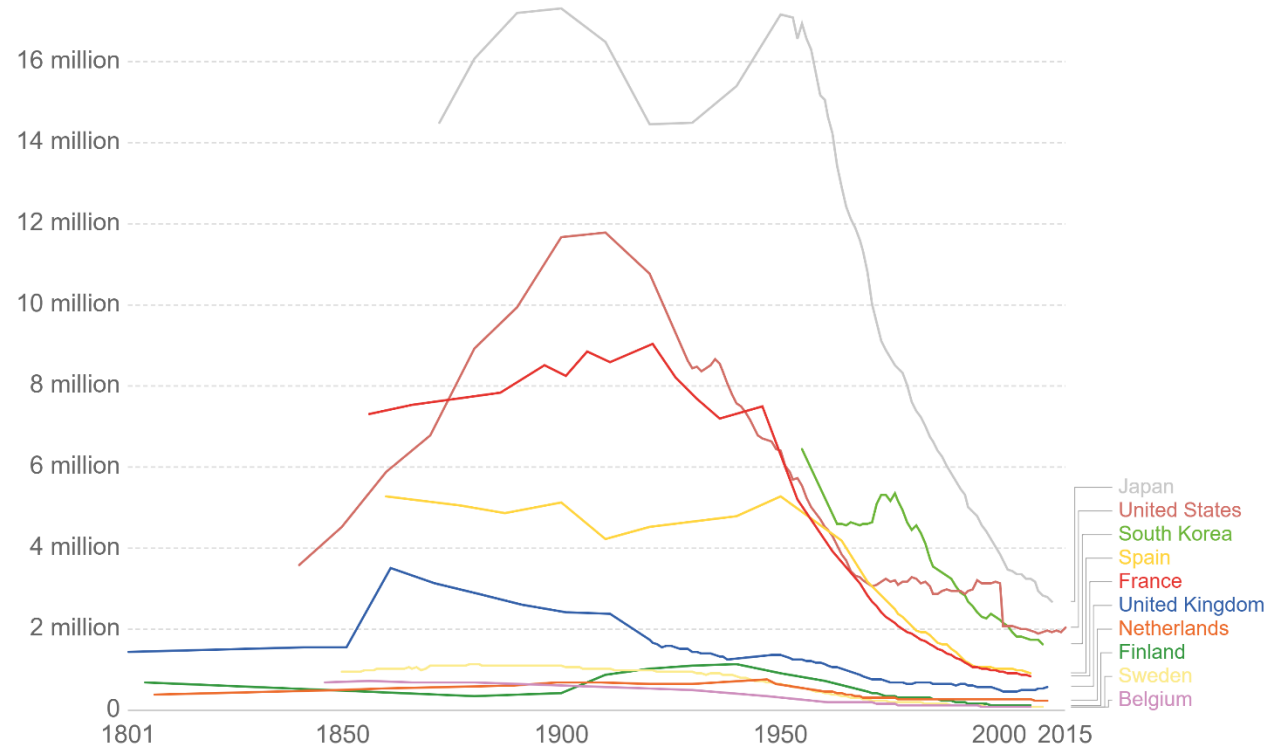
Why Fleet Operation? ②



Number of people employed in agriculture since 1800

The total number of individuals in agricultural employment across select countries from the year 1800.

Our World
in Data



Source: Our World In Data based on Herrendorf et al. (2014)

OurWorldInData.org/employment-in-agriculture • CC BY

- Less Workers
- Larger Vehicles
- Soil Compaction
- Lower Yields

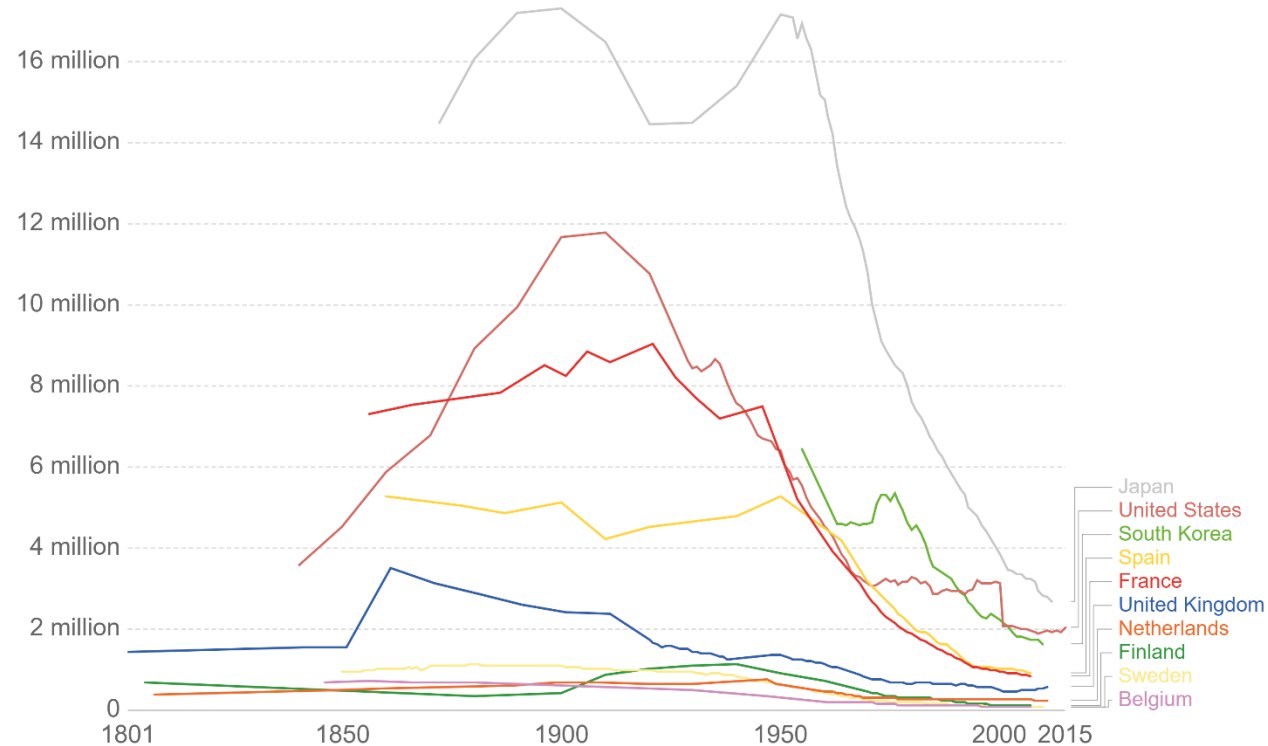


Why Fleet Operation? ②



Number of people employed in agriculture since 1800
The total number of individuals in agricultural employment across select countries from the year 1800.

Our World
in Data

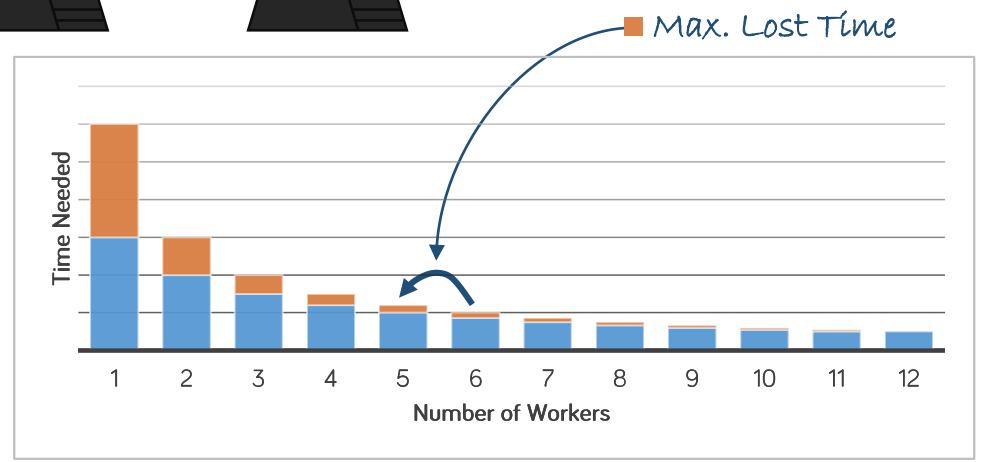
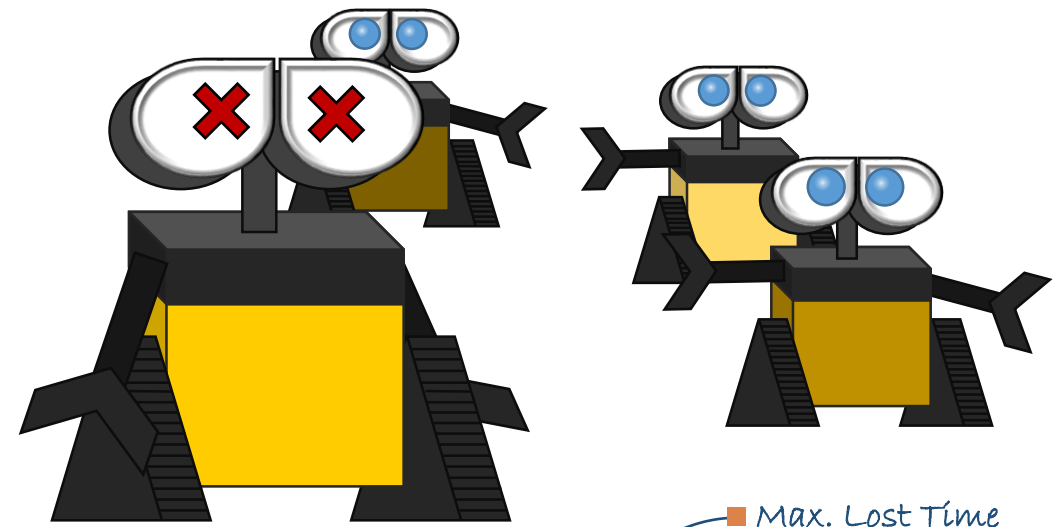


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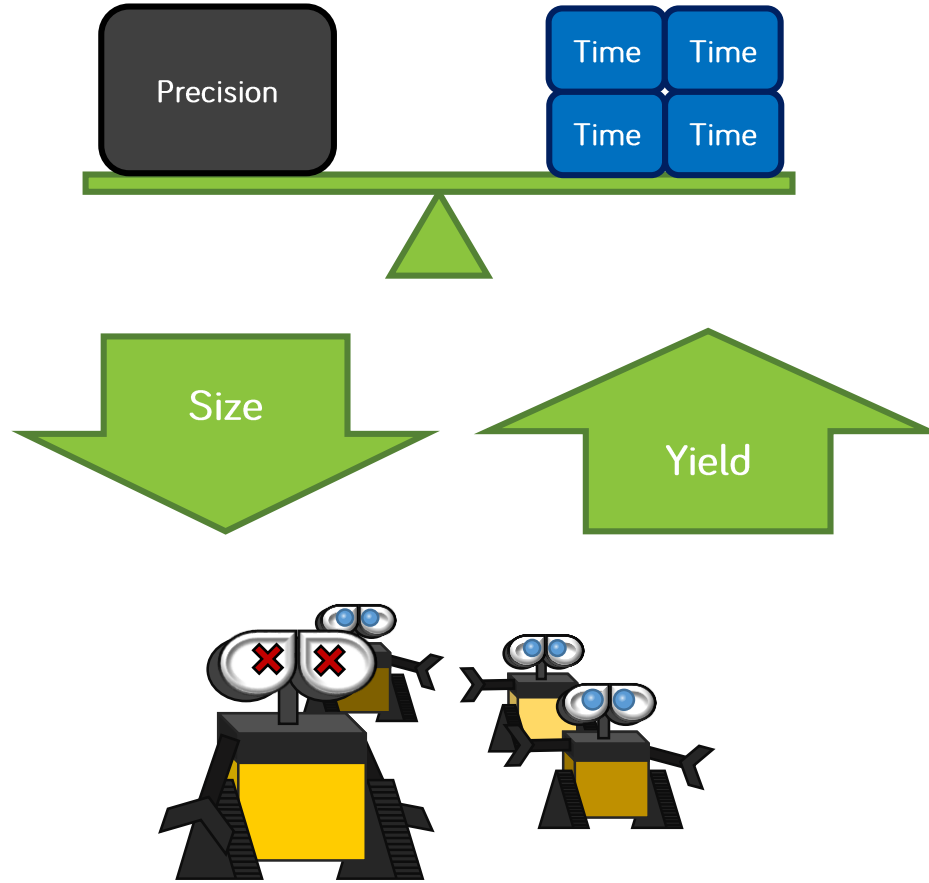
- Less Workers
- *Multiple*
- ~~Larger~~ Vehicles
- *Reducing* ✓ Soil Compaction
- *Higher* ~~Lower~~ Yields

Why Fleet Operation? ③



Reasons to Adopt Fleet Operation

- Reduction in overall time
- Increase in Precision and Care
- Higher Yields
- Lower Soil Compaction
- Redundancy



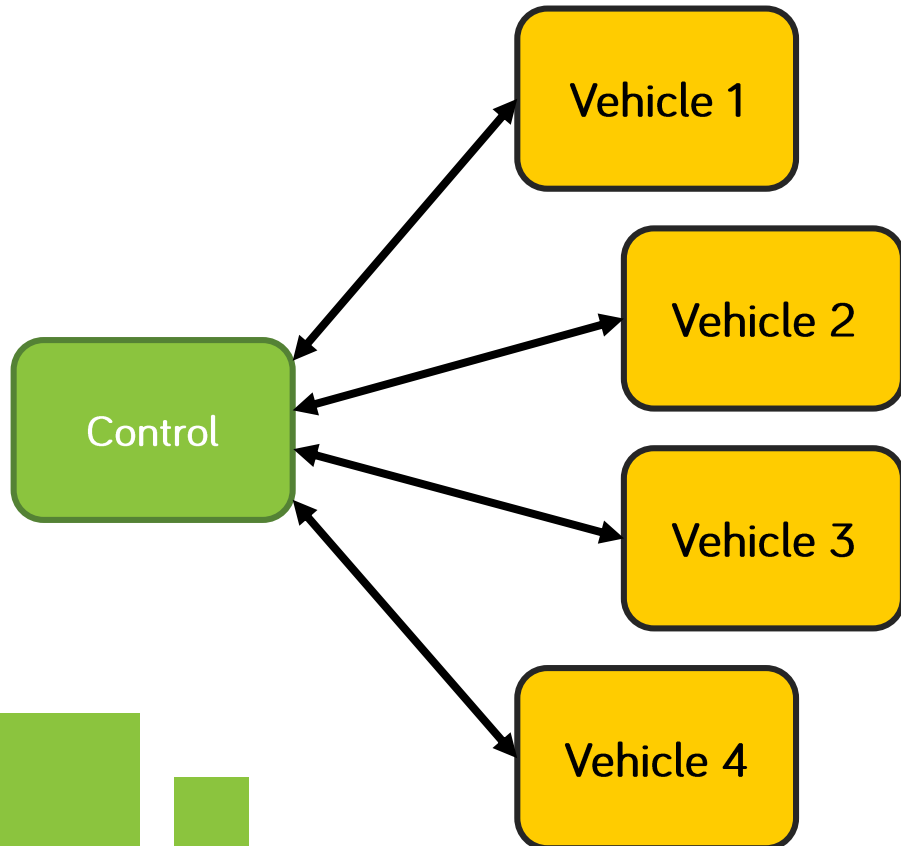
Fleet Requirements

- No Double Work
- No Work Remaining
- No Deadlocks

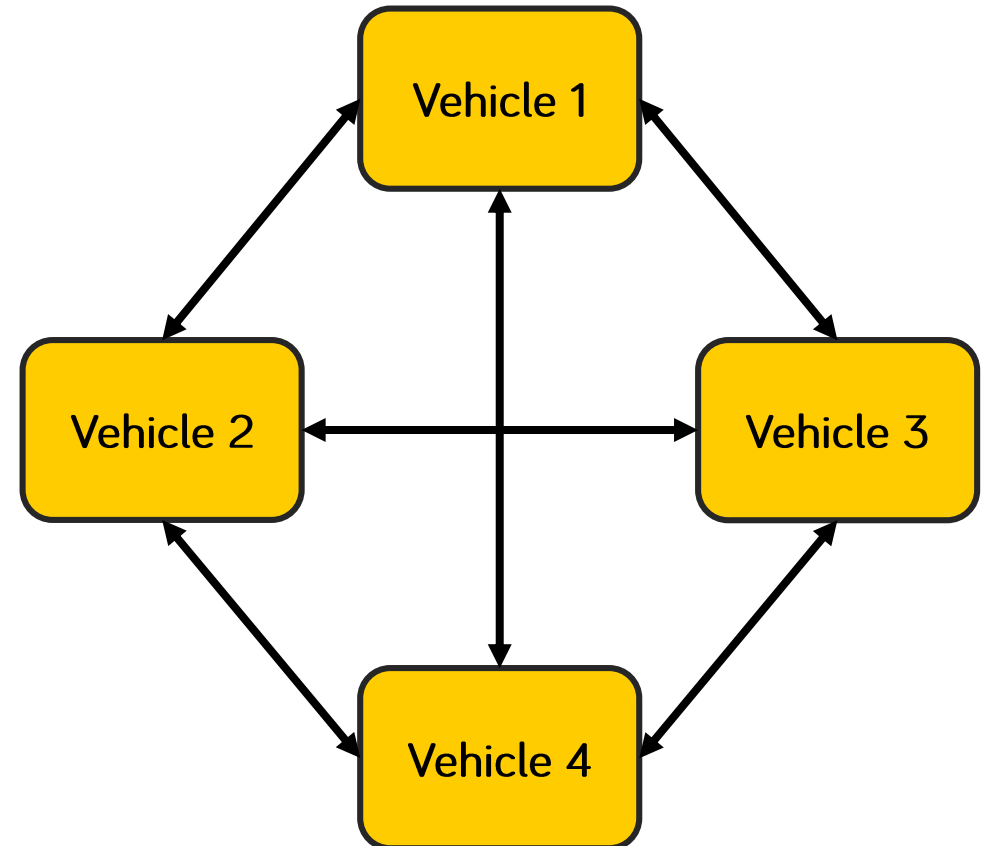


Controller design

- Centralised Control

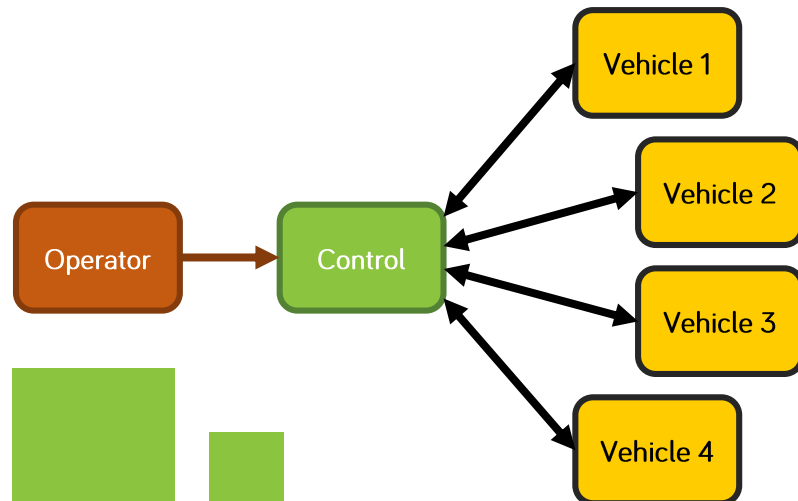


- Decentralised Control

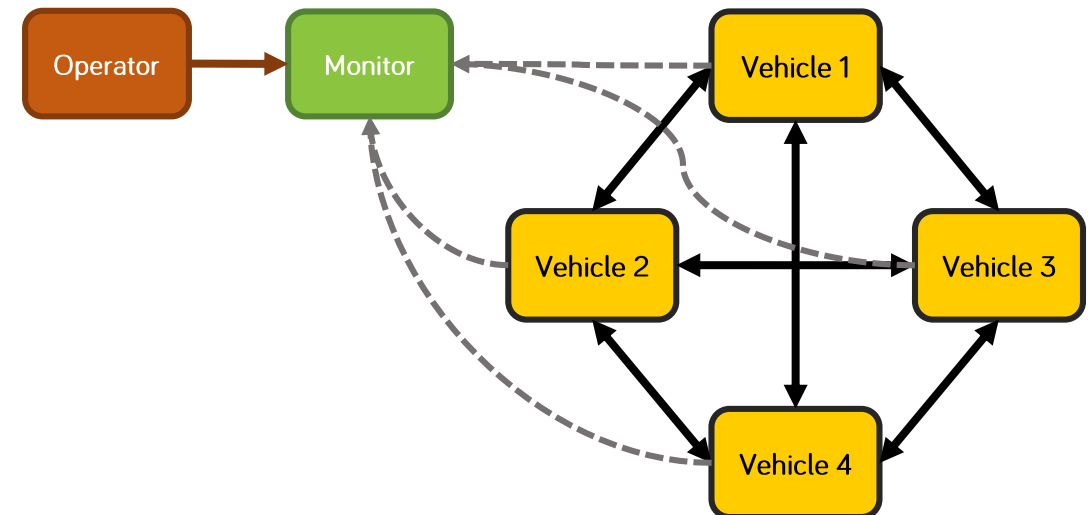


Controller design

- Centralised Control
 - One Overview
 - More Computational Power
 - Less Scalable



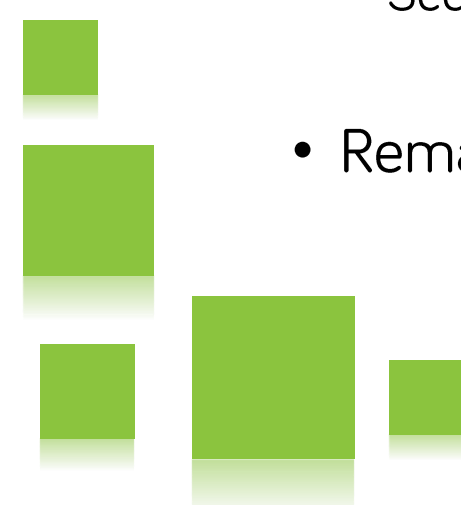
- Decentralised Control
 - Decisions taken locally
 - Less Computational Power
 - Easier Scalable





Fleet Supervision

- Single Vehicle Properties
 - Location & Speed
 - Remaining Fuel/Charge
 - Remaining Applicant
 - Seeds/Herbicide/Water
 - Remaining Planned Work
- Overall Properties
 - Field/Crop yields
 - Field Status
 - Work carried out vs. remaining
 - Remaining Applicant
 - Issues & Problems



Fleet Supervision



- Graphical User Interface

- Overview

- Single Unit Status

- High-level Overruling

