
Industrial applications of reinforcement learning

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TCS Research

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Well-known RL applications

- Autonomous driving
- Gameplay: Go, blackjack, Atari, ...
- Robotics: path planning, task allocation



Joint Research with IIT
Kanpur Robotics Lab

5th in 2016
4th in 2017

TCS Research Areas

- Software
- Life Sciences
- Physical Sciences
- Behavioral, Social, Business Sciences
- Cyber-Physical Systems
- Embedded Systems & Robotics
- Data and Decision Sciences
 - Machine perception (speech, text, vision)
 - Predictive modeling (sensor fusion, IoT)
 - Intelligent control & planning (RL)

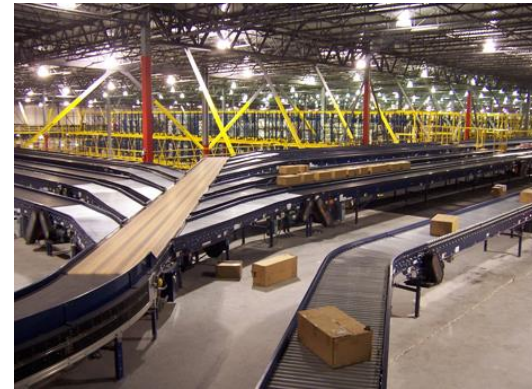
Industry-related RL initiatives at TCS

Railway Scheduling



irfca.org

Supply Chain Operations



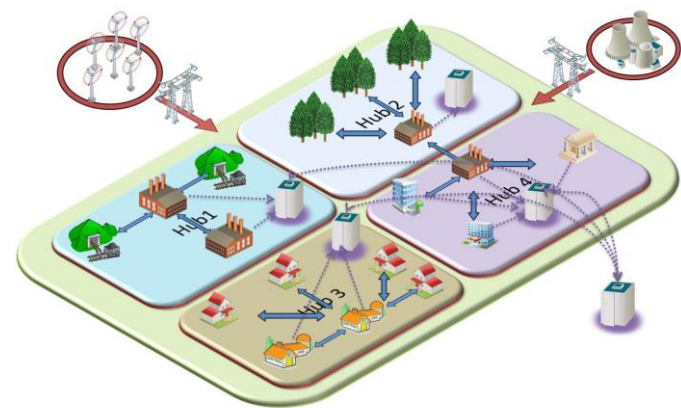
www.rbic.com

Port Planning



www.123rf.com

Energy Trading



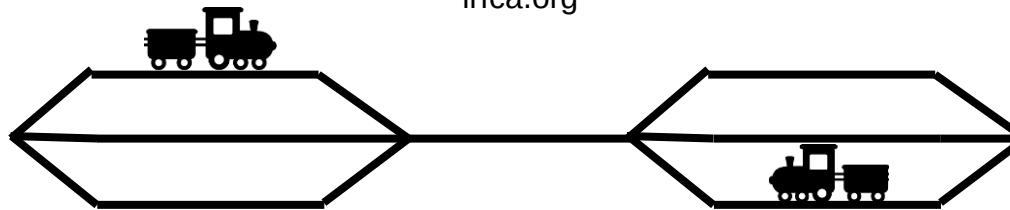
nortech.oulu.fi

Railway scheduling

A time-indexed mapping of trains to track resources



irfca.org



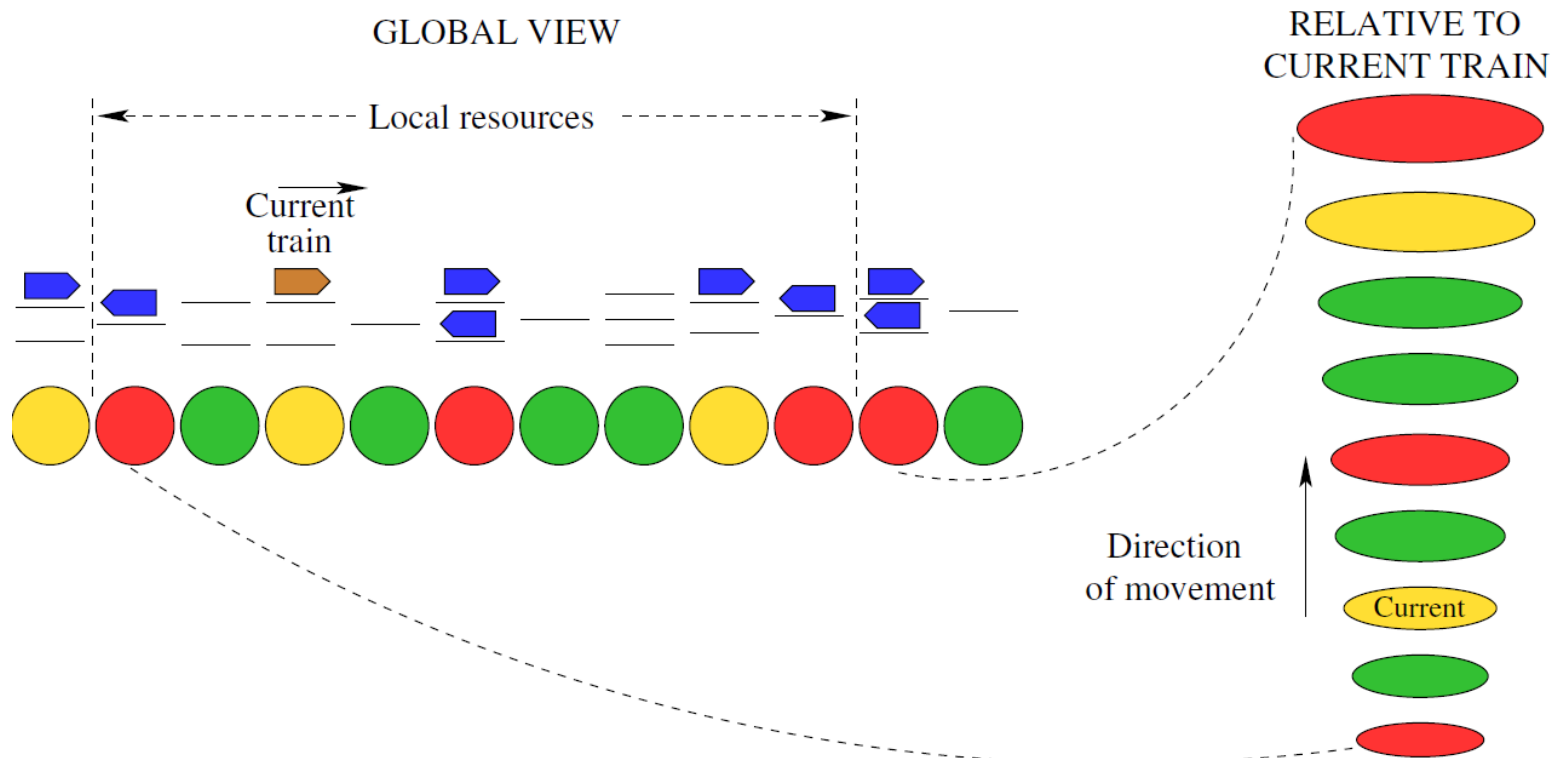
Station A

Station B

Railway scheduling

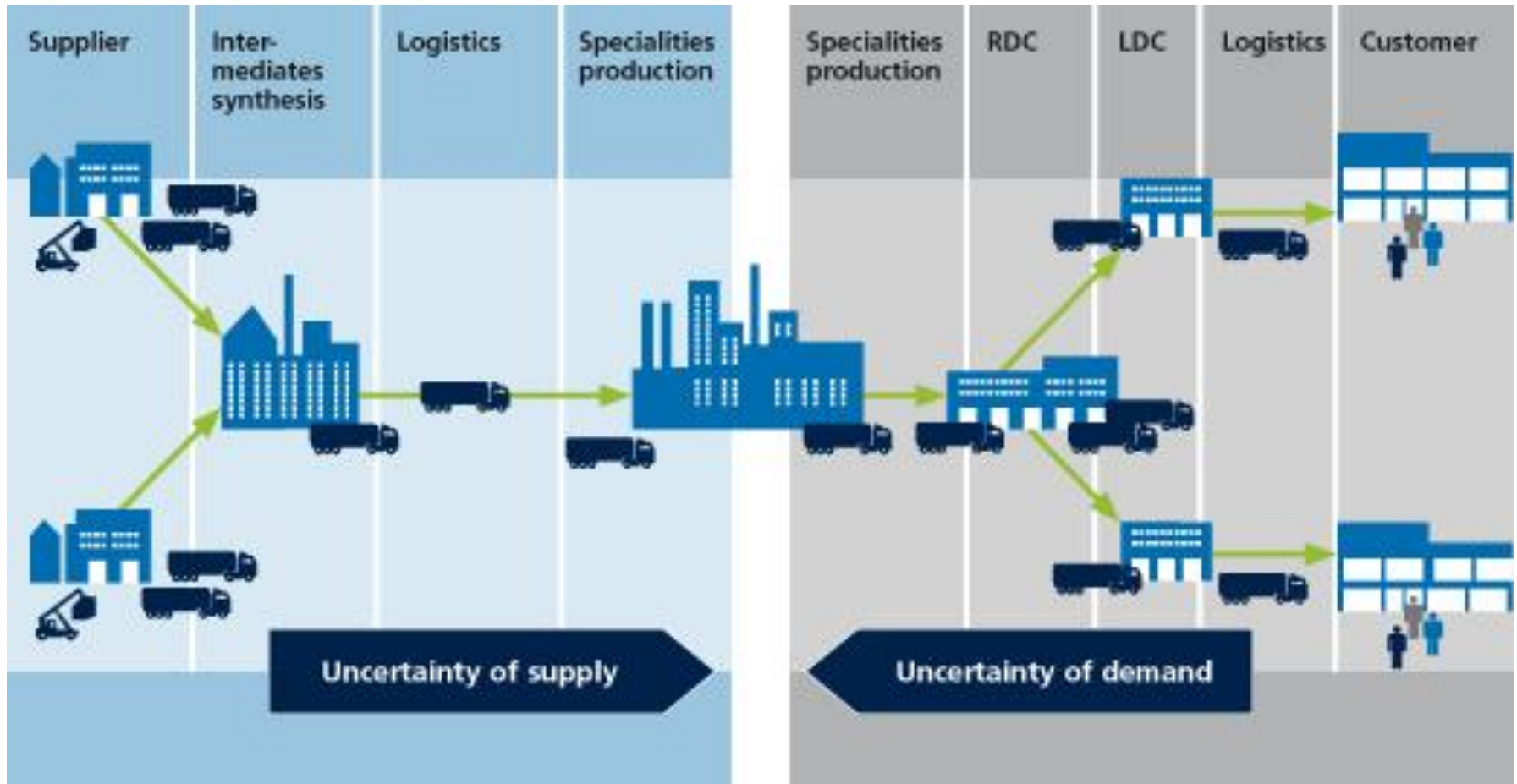
Primary challenges

Scale, Deadlocks, Flexibility



Supply Chain Operations

Improve efficiency using globally-aware decision making



iimfwetraining.com

Supply Chain Operations

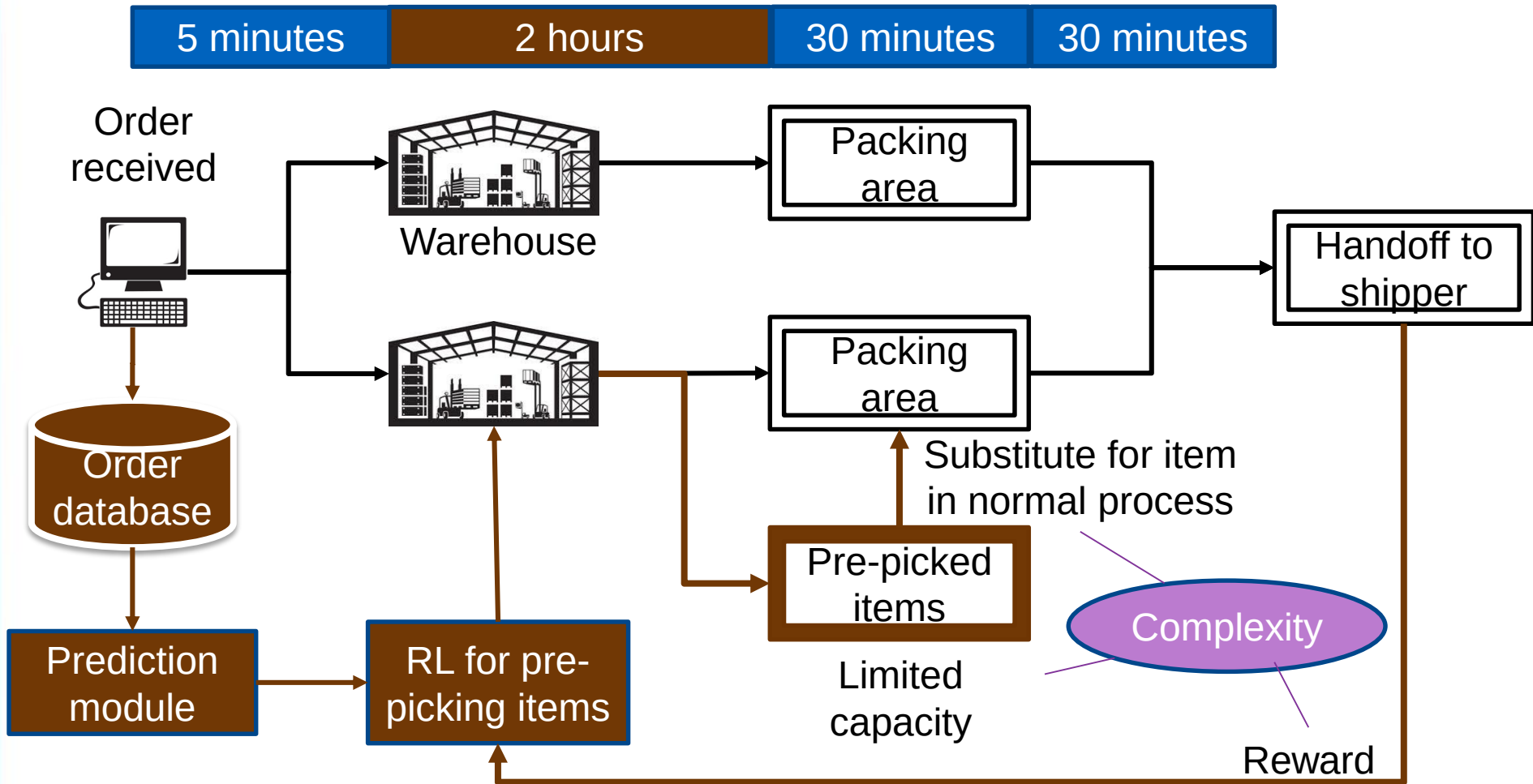
Current use case: distribution center operations

Goal: Reduce time from order receipt to shipment departure



wepartypatriots.com

Supply Chain Operations



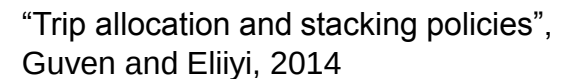
Container Loading in Ports

Minimize number of shuffles when loading containers

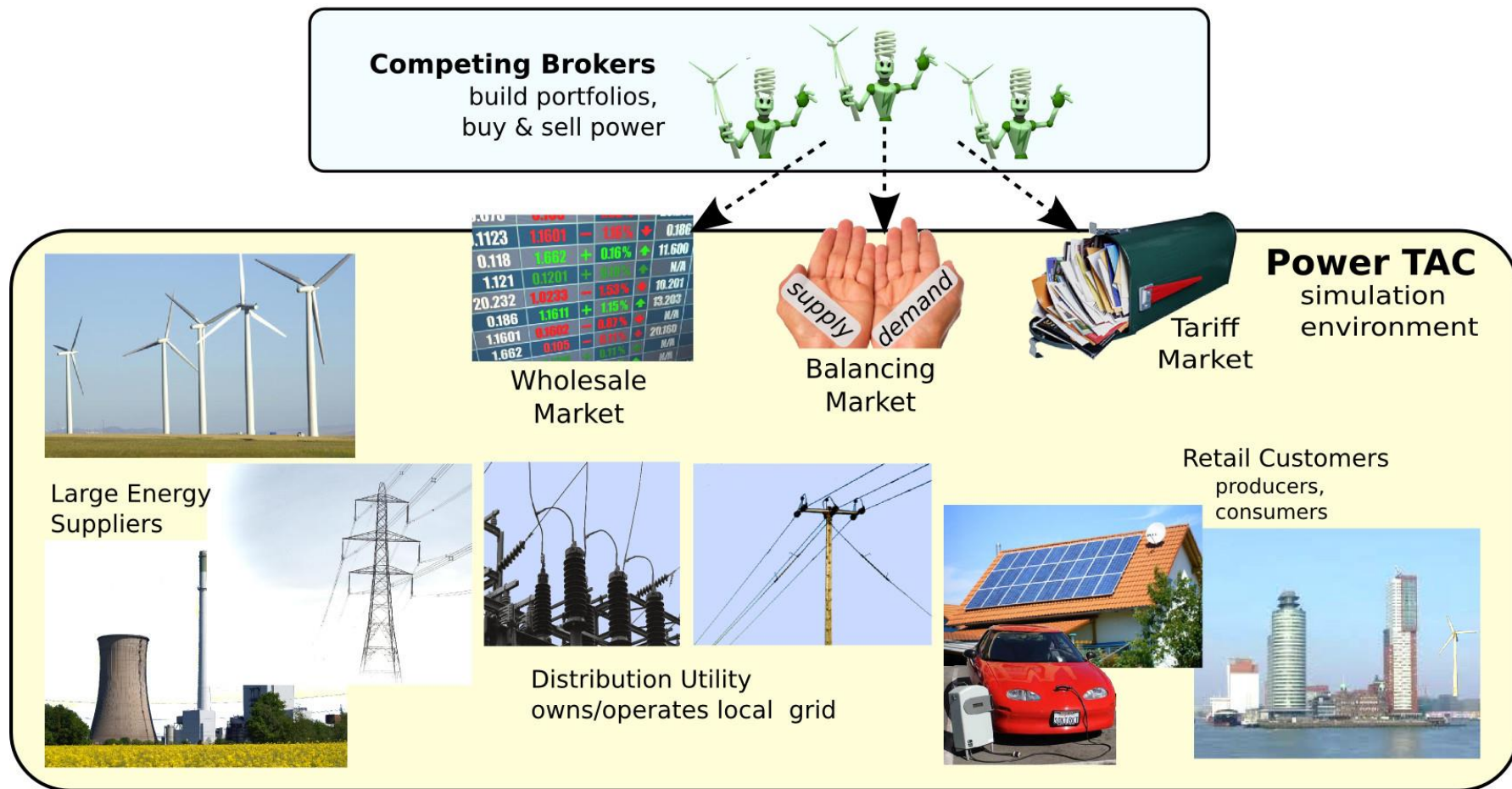


www.123rf.com

Container Loading in Ports

[illegible]

Contracts in energy markets



- RL is moving quickly from theory to application
- More field testing should generate new interesting problems
- Therefore, new thesis topics!