Applications of control systems in practice

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Outline

Introduction of the Discrete Systems Lab Team

Prof. Wojciech Bożejko

Prof. Mieczysław Wodecki

Dr Jarosław Pempera

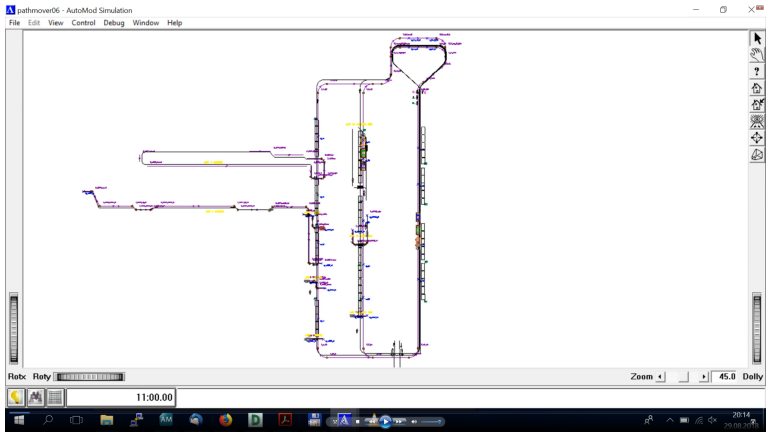
Dr Mariusz Uchroński

Our team is researching **new optimization techniques** in the field of **industry** and **logistics** of Lower Silesia companies

Optimization of production and transport in Toyota

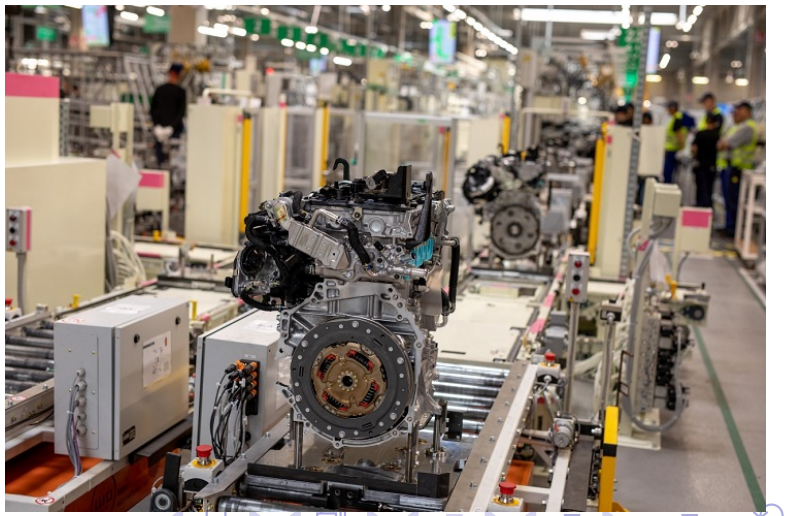
Aim

Shorten production schedule, cycle time and/or transportation routes in the Toyota engines factory



Method

Numerical optimization algorithms.
Transportation modelling



Result

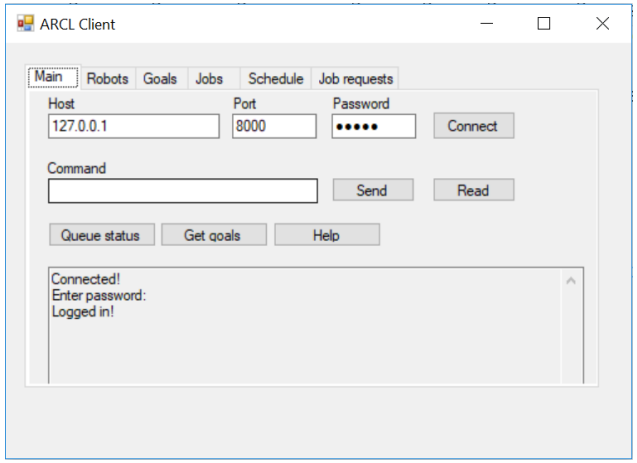
Shortening transportation cycle time

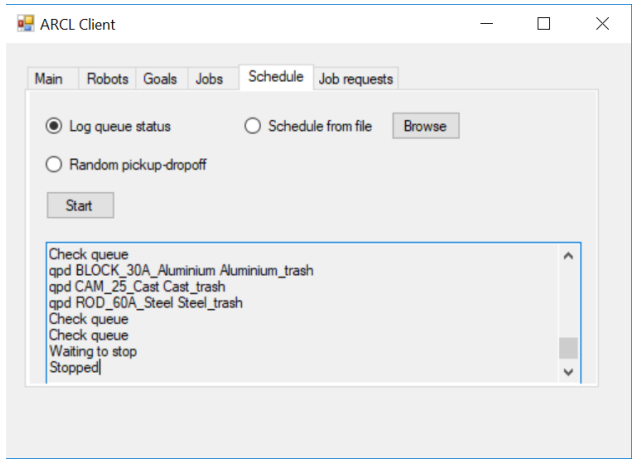
Optimization of production and transport in Toyota

Integration with AGV network

- Integration with Omron Enterprise Manger (software/hardware platform) using ARCL (Advanced Robotics Control Language)
- Exchange data about robots (AGV), goals (machines) and jobs
- Apply schedule to the AGV network

AGV – Automated Guided Vehicle





Optimization of production and transport in Toyota

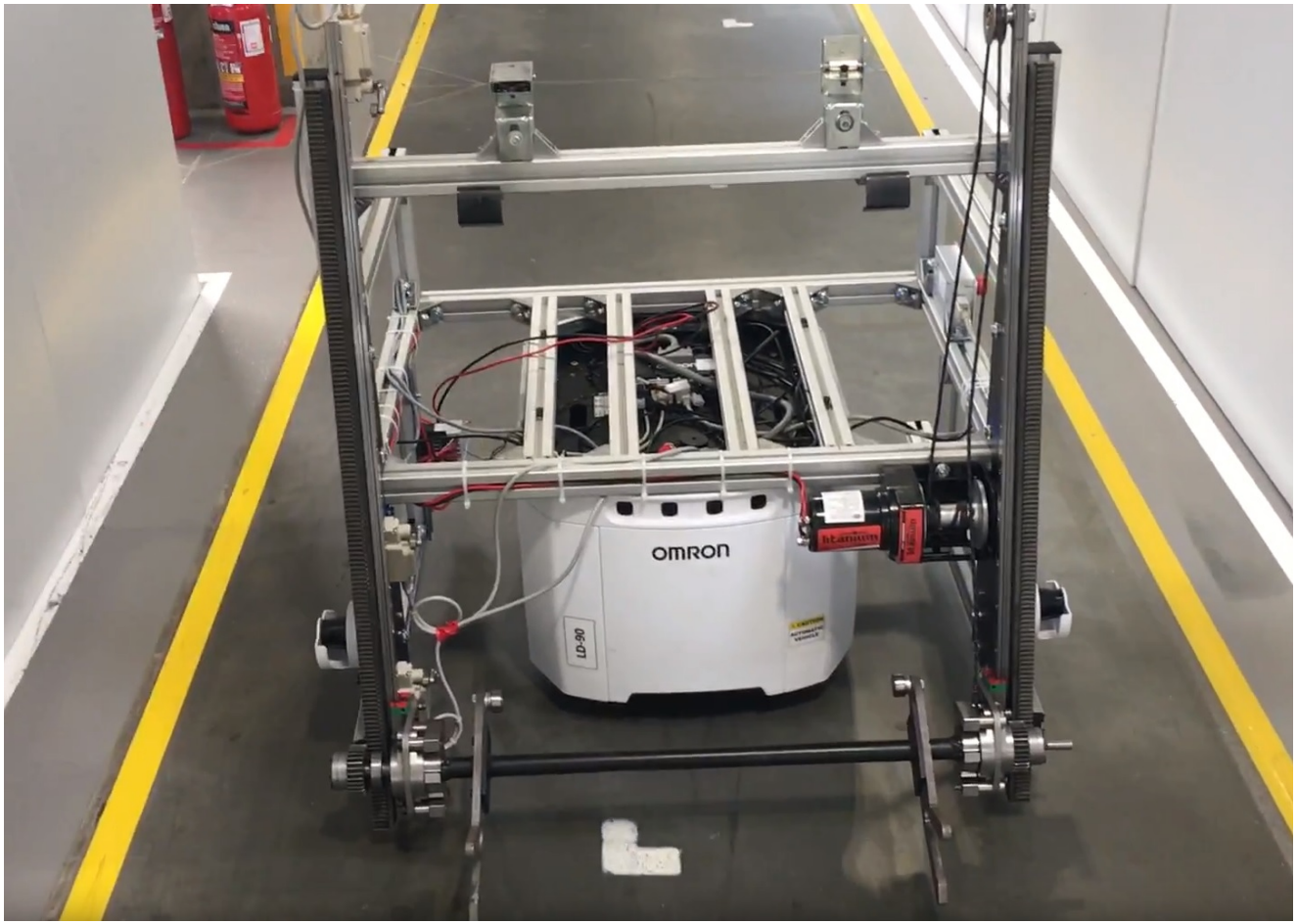


Figure: Our AGV for bringing waste from production

Optimization of production and transport in Toyota

Figure: AGV at the machine

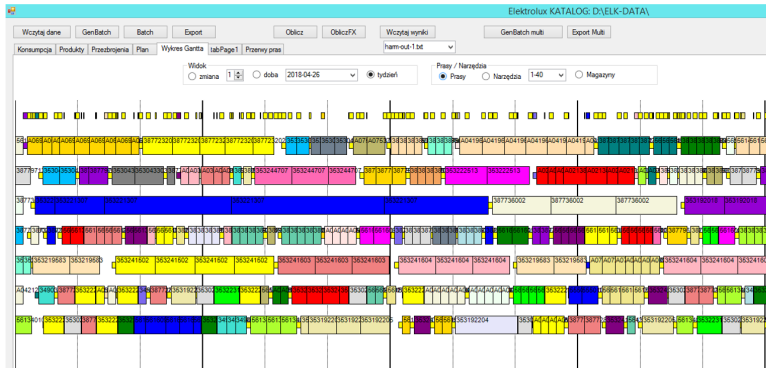
Scheduling the work of industrial presses in Electrolux

Aim

Minimization of setups of industrial presses

Result

Design and implementation of a **computer system** supporting planning in the industrial press department of a leading European home appliances manufacturer. An integral part of the application are **optimization algorithms** based on **artificial intelligence** methods.



Scheduling the work of industrial presses in Electrolux

The following **constraints** have been taken into account in the implementation of the project

- the need to make a setup of a press between various products,
- one brigade performing setups of all presses,
- limited buffer of the storage capacity,
- synchronization of production with the demand resulting from the target product assembly plan.

Application of research includes designing of a collection of IT tools for creating support systems in the area of:

- scheduling the work of industrial presses
- visualization of schedules and stocks of three main warehouses.

Society 5.0 subject is represented in the Faculty of Electronics by a group of prof. Przemysław Śliwiński