

Propositions

attached to the thesis

Robotized Warehouses
Design and Performance Analysis

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I

Robot intelligence is still far from matching the full range of human picker capabilities. Manual picking systems have high operational flexibility, are resilient to system failures, and can handle complex situations with intuition.

(This Thesis)

II

The main challenge in many fulfillment centers is to adapt the picking capacity to the order volume required.

(Chapter 2)

III

Developing a realistic and detailed simulation model for analyzing all possible design scenarios and parameter settings is very time-consuming. Therefore, at the early conceptualization stage, analytical models, such as queueing network models, can be used to reduce the design search space and identify a few promising configurations, which can then be fine-tuned using simulation.

(Chapter 2 and 3)

IV

Since fully manual pickers and pickers with PS-AMRs can work side-by-side, companies that are deliberating automation of their pick process can start with a small number of PS-AMRs and gradually expand this over time without affecting their current picking operation. Hence, investment cost and automation risk decrease significantly.

(Chapter 4)

V

Increased social awareness, together with governmental regulations for carbon emissions and waste management, has transformed sustainability from an ideal to an absolute necessity for companies.

(Chapter 5)

VI

Academic institutions should push their Ph.D. graduates out into the industry with as much vigor as they push them into academia. The potential for positive change is diminished when Ph.D. graduates forever remain in academic silos.

VII

The journalists' job is not to report that person A says it is raining, and person B says it is not. Their job is to open the window and see whether it is raining or not.

VIII

Censorship has evolved from blocking people's access to information to flooding them with irrelevant and fake information. In ancient times having power meant having access to data. In the twenty-first century, having power means knowing how to ignore "*alternative facts*".

(Inspired by Yuval Noah Harari)

IX

We need to be unrealistic, unreasonable, and impossible if we want to change the world. Advocates for abolishing slavery, for suffrage for women, and for same-sex marriage were also once branded lunatics by the status quo until history proved them right.

(Inspired by Rutger Bregman)

X

There is a clear distinction between Marvel movies and cinema; the former is a sleep aid for long-haul flights while the latter is a form of art.

XI

What you seek is seeking you.

(Rumi)