

# Max Waterhout

## Junior Engineer AKOS

Purmerend, Netherlands (+31) 655680141 06-09-1998

[maxwaterhout@outlook.com](mailto:maxwaterhout@outlook.com) [www.linkedin.com/in/max-waterhout/](https://www.linkedin.com/in/max-waterhout/)

<https://maxiew123.github.io/>



I am a robotics engineer specialized in Machine Learning. I thrive in a dynamic and fast-paced flat organization that fosters a culture of innovation and encourages collaboration. In the future, my goal is to continually expand my knowledge and expertise in MLOps, ultimately having complete knowledge of an efficient full machine learning pipeline.

## Experience

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May 2023 - Present

### **Technical University of Delft, Delft** – *Master thesis*

In my thesis, I developed a chess-playing robot using an RGB or RGB-Depth camera. The key aspect involved training a 6D pose estimation model through deep learning techniques, utilizing a custom synthetic dataset crafted from 3D scans of chess pieces. Furthermore, I created a validation dataset containing real-world data to assess the efficacy of my models to evaluate the Simulation to Reality gap. The thesis also carried out a comparative analysis of the results from 6D pose estimation models, differentiating between those based on RGB and RGB with depth refinement. Additionally, the research includes an evaluation of a robotic arm's picking capabilities on the small chess pieces utilizing the trained models. The complete thesis can be read at: [Evaluating 6D pose estimation accuracy with synthetic data | TU Delft Repositories](https://repository.tudelft.nl/islandora/object/uuid%3A4506c969-220d-4257-ad5b-91853ea83ccb?collection=education) (<https://repository.tudelft.nl/islandora/object/uuid%3A4506c969-220d-4257-ad5b-91853ea83ccb?collection=education>)

February 2023 - May 2023

### **Technical University of Delft, Delft** – *Literature study*

I conducted a comprehensive literature review on the topic of how depth information impacts 6D pose estimation for priori known objects at varying camera distances.

September 2022 - October 2022

### **Police, Amsterdam** – *Internship Data Scientist*

In my role at Team Efficiency Operational Information, I successfully designed and implemented a video classification system for analyzing seized videos. This system identifies and categorizes specific content, such as identifying videos related to guns or money laundering from vast collections of videos extracted from seized devices, including telephones with thousands of recordings.

June 2022 - September 2022

## **BIS publishers, Amsterdam – *Data analyst***

During my employment, I contributed to data analysis efforts, gaining valuable insights from incoming data. Notably, I played a role in enhancing stock management and predicting future book sales.

September 2019 - August 2020

## **Hörmann, Alkmaar – *Junior Engineer R&D***

During my tenure, I actively participated in an R&D project team at Hörmann Alkmaar, with the primary objective of expanding and enhancing the product portfolio. My focus was mostly on a project where a blocking system for trucks was developed. My involvement spanned the entire research-to-prototype journey, encompassing diverse tasks such as CAD programming, FEM calculations, hands-on construction of prototypes, and effective communication with clients and colleagues. I am proud to highlight that in October 2022, the successful completion of this project resulted in the launch of the Radblockiersystem MWB2 (

 Radblockiersystem MWB2 - Mehr Sicherheit an der Verladestelle | Hörmann )

January 2019 - May 2019

## **Holland Mechanics, Purmerend – *Internship Mechanical Engineer***

Engaged in the enhancement and expansion of 'The Pro Truer,' a bicycle wheel machine, by improving existing functions and introducing new features.

September 2019 - August 2020

## **Pneutec BV, Hoofddorp – *Internship Mechanical Engineer***

Designed different tools to improve and accelerate the processes at Pneutec within a cleanroom where they assembled hose bundles for ASML.

2010 - 2022

## **Intratuin, Beemster – *Side job: Garden center employee***

Helping with my father's company by fulfilling diverse responsibilities, including providing customer service, handling deliveries, conducting training sessions and supervising new (young) team members.

## **Education**

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September 2021 - Present

## **Technical University of Delft, Delft – *Master Robotics***

September 2020 - May 2021

## **Technical University of Delft, Delft – *Pre-Master Robotics***

September 2015 - May 2019

## Hogeschool van Amsterdam (HvA) , Amsterdam – *Mechanical Engineering (ED&I)*

September 2010 - May 2015

**Jan van Egmond, Purmerend** – *HAVO (Senior general secondary education)*

### Relevant courses

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- Machine learning
- Dynamics and Control
- Robot Software Practicals
- Machine perception
- Planning & Decision Making
- Deep-Learning
- Full-stack Deep Learning
- Computer vision by Deep learning
- Human & Robot Interaction
- Control in Human & Robot Interaction
- Safety sciences
- Object Oriented Scientific Programming with C++

### Relevant certificates

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### Relevant skills

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- **Languages:** Dutch (native), English (fluently)
- **Programming languages:** Python, C++ , Excel
- **Data Science:** MLOps, Docker, Streamlit, PyTorch, Git, Github, TensorFlow, Computer vision (Classification, Object detection), Natural Language Processing (NLP), Forecasting, Pandas, Linux, OpenCV, PowerBI
- **CAD:** CREO, Solidworks, Finite element methods (FEM)
- **Robotics:** Robot Operating System (ROS), Gazebo
- **Proptotyping:** CNC Machining, Milling, Lathe, 3D printing, VOL-VCA