

AUTOMATED TAPPING CELL FOR BOSCH PROFILES AND METAL SHEETS

Verheyden Jasper & Vansteenvoort Roos

Bridging programme for Master of Electromechanical Engineering Technology

Situation

LASE (Labor Aiding Systems Europe) develops automated production lines for the automotive and mechanical engineering industries. In their production process, **Bosh profiles and metal sheets are currently tapped** manually.

Project focus:

- Tapping Bosh profiles
- Tapping sheets based on **DXF** files
- Automatic handling, clamping, and tool change

Problem

Current situation:

- Manual tapping using a tapping arm
- Time-consuming for production runs and large volumes
- High operator workload
- Limited automation

Design criteria

- Profiles: **45x90 to 90x180**
- Metal sheets **up to 1500x1000x20**
- Tapping from M4 to M12
- Fixed zero point for positioning
- Automatic tool change
- Chip removal and lubrication of tool
- Max size robot cell : **2450x3000x2600**
- Compliant with safety standards

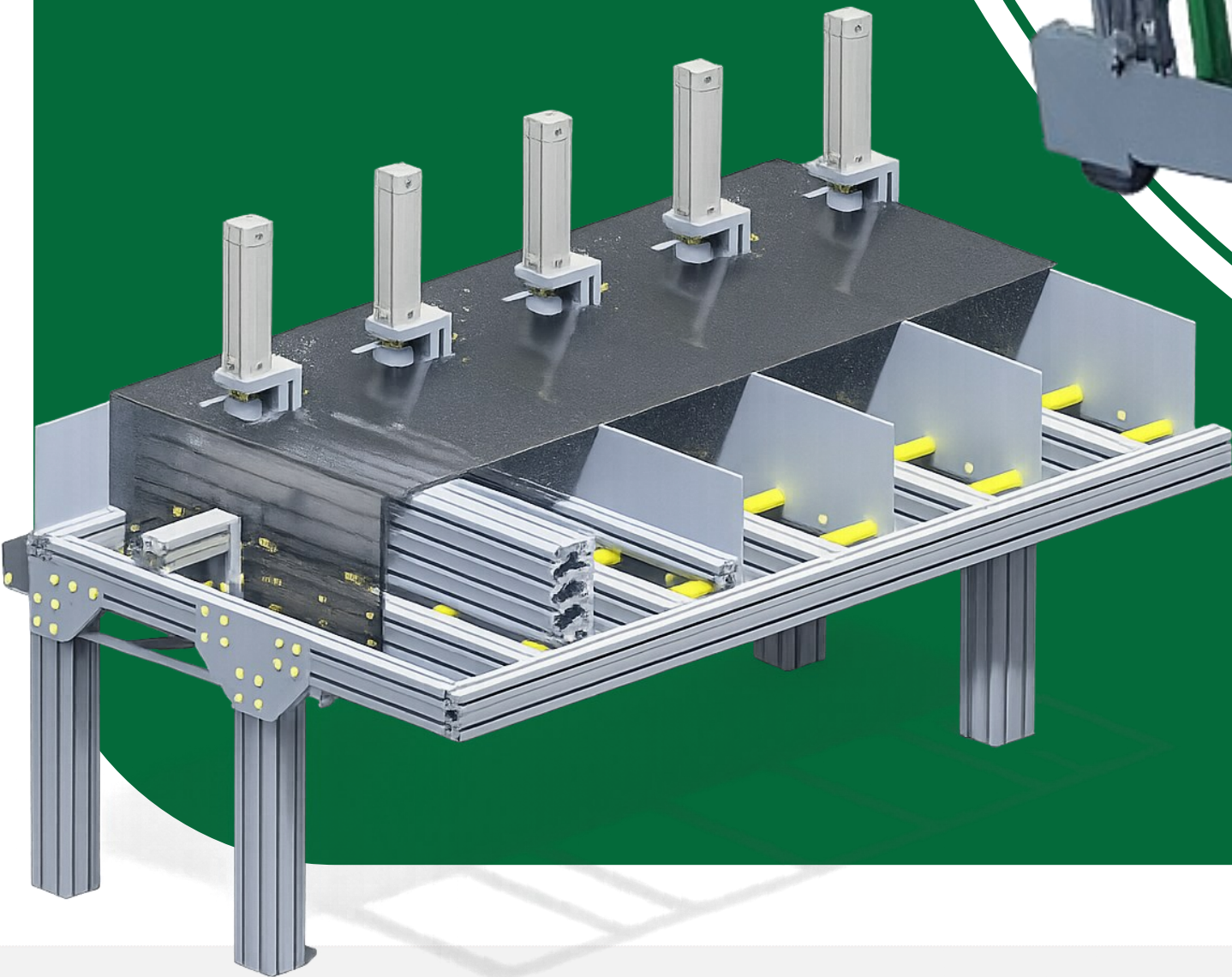
Augmented reality

1. scan the QR code
2. Download the Vuforia View App
3. Using this app, scan the cube logo
4. Experience out design in augmented reality!



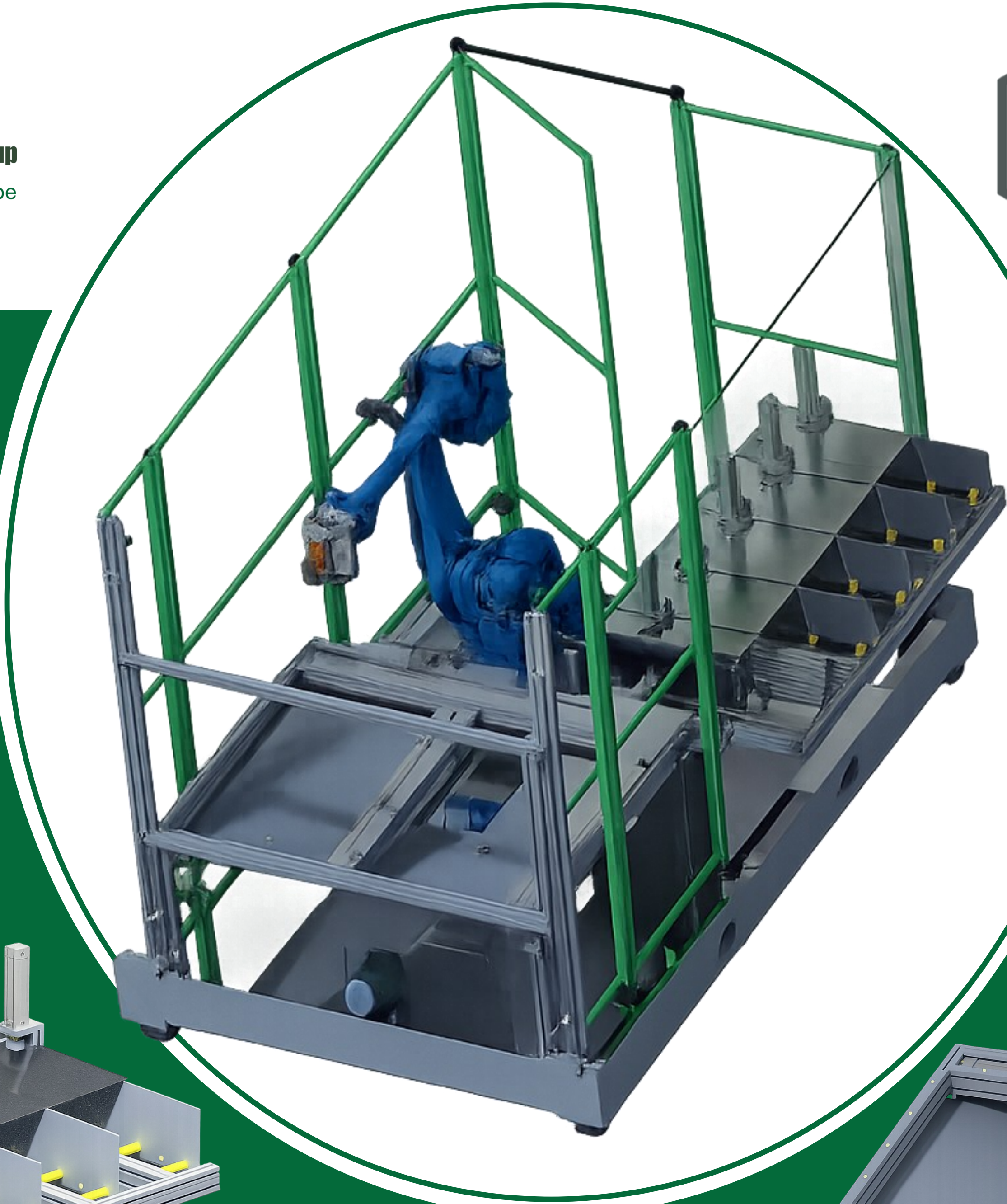
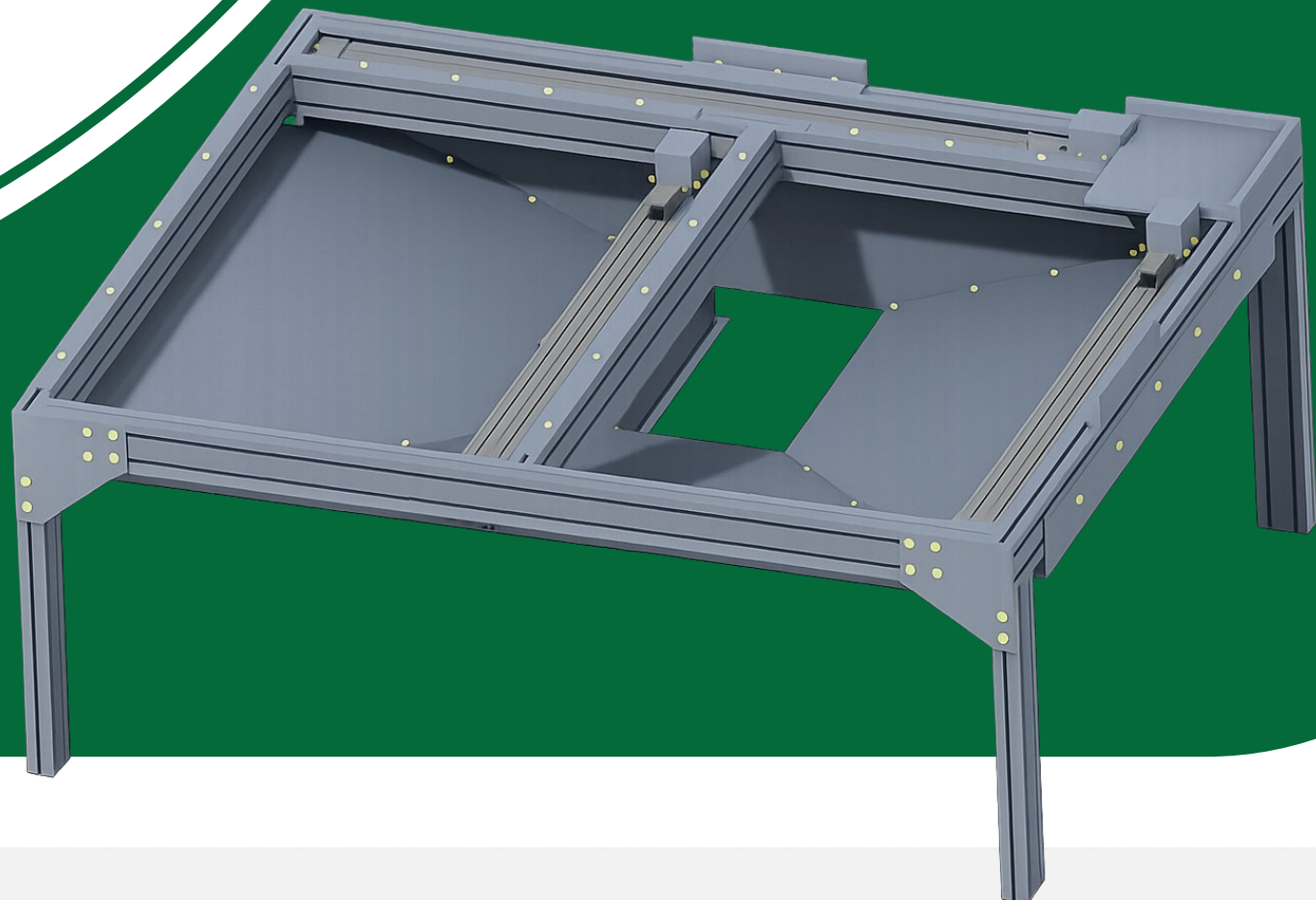
Profile System

Profiles are manually loaded into the clamping station by the operator, after which the system **automatically clamps** the workpiece. Each profile is individually secured in the X-and Y-direction to ensure a stable and repeatable reference position for robotic tapping. **Capacitive sensors** detect the dimensions of the profile, allowing the system to adapt to different profile size.



Sheet Metal System

The plate is positioned and will be secured using three **electromechanical linear actuators**, to guarantee accurate fixation during the **tapping** process in the **fixed zero point**. This process focusses on reliable positioning, secure clamping of **varying plate dimensions**. Tool changes between thread sizes **M4 to M12** are performed using a DIN-quick change system, with the tools are stored in a dedicated holder and lubricated through an oil bath before operation.



Supervisors / Co-supervisors / Advisors: Dr. Ing. John Bijnens — Prof. Dr. Ir. Michaël Daenen — Prof. Dr. Ing. Karel Kellens
Prof. Dr. Jeroen Lievens — Ing. Gert Peetersem (extern)