Kamaro Engineering e.V.

University Club 7.11.2023
Introduction

Students group and nonprofit organization at KIT

Founded in 2008

20 - 40 Members

Field Robot Event participant since 2010
Germany fears seasonal labour shortages as Ukraine war rages on

By Julia Dahn | EURACTIV.de | translated by Daniel Eck  🕒Apr 4, 2022

Germany also signed mediation agreements with Georgia and Moldova. Workers are expected from both countries this year, according to the ministry. (Shutterstock)

Supporter
Funded by the European Union
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From Twitter
Tweets by EURACTIV Agrifood

Languages: Français | Deutsch

[1] Source: https://www.euractiv.com/
Problems in agriculture

Labor costs on the rise
Small margins and desire for cost reduction
Increased demand
Climate change
Aegaeon

Very, very, low cost automation
Typical solutions in automation

Out of the box:
Expensive
Heavy
Strong
Precise
Robotics in the Agriculture sector

Problem: Advancements in robotics mainly driven by manufacturing

Agriculture is too small to incentivize large manufacturers to offer solutions

We need robots that are inexpensive and reliable but not super strong

Aegaeon: Robot arm by Kamaro

- Fully 3d-printed
- 3 axes
- Cheap RC servos
- Biomechanical gripper developed in-house
- Connection via hot-swappable CAN-Bus

Cost: Under 170 Euros!
Crop detection on a Budget

Finding the strawberry in the haystack
Computer vision on our robot betelgeuse

Available hardware:
Nvidia Jetson Xavier NX

Running at 3-7 FPS on Battery Power and concurrent to arm and robot motors

Images are generated from an Intel realsense
The system in action
Arm in action
Conclusion

Total Cost:
+ Arm (170 €)
+ Realsense (350 €)
+ Nvidia Jetson Xavier Nx (600 €)
= 1120 €

Grabber works really well
Servos don’t have linear response
Redesign of arm necessary
Realsense is inaccurate at low distance
What’s next for Kamaro?
Kamaro Engineering: Outlook

Explore new vehicle designs
Reduce tech debt/Improve technology stack
Human-Robot-Collaboration
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Our website with semi-regular blog posts
www.kamaro-engineering.de
Sources

