



Zeynep Osmanpaşaoğlu

Robotics Engineer
and Researcher

Contact

+90 538 314 24 44

zeynepsezenarseven@gmail.com

[linkedin.com/in/zeynep-osmanpaşaoğlu](https://www.linkedin.com/in/zeynep-osmanpaşaoğlu)

Education

- Ph.D. in Mechatronics**
Marmara University 2020-Present
Specialization in combining robotics systems with AI tools
- Master's degree in Mechatronics**
Marmara University 2008- 2013
Especially worked on robotic systems design and software
- Bachelor of Science in Physics**
Işık University 2002 - 2008

Experience

- Robot Product Team Administrator**
Mitsubishi Electric Turkey Sep 2023- Feb 2024
- Robot Support Engineer**
Mitsubishi Electric Turkey Apr 2018- Sep 2023
- Automation and International Sales Representative**
TTM Makine - Chicago USA Branch Apr 2016 - Oct 2017
- Robotic Process Automation Representative**
TTM Makine Apr 2010 - Apr 2016

Paper ID: 397

From Voice to Efficiency: Natural Language Processing for Energy-Optimized Robot Programs

Abstract- Despite robotic automation is crucial for producing renewable energy technology, operational energy optimization is often overlooked as it typically requires expert intervention. This study proposes a hybrid architecture using natural language commands to optimize robot programs for either speed or energy efficiency. The framework integrates a Large Language Model (LLM) with an expert-defined Knowledge Base (KB) to create a verifiable optimization tool. Evaluated in a simulated pick-and-place task, the energy-prioritized program achieved a 42.1% reduction in total energy consumption with a 15.8% increase in process time compared to its speed-prioritized counterpart. These results confirm that significant energy savings, made accessible through natural language, can substantially reduce the carbon footprint of renewable energy production.