AMPER-EV

Al-Powered Energy-Efficient Software Optimization for Battery Management in Electric Vehicles



Project Coordinator: Adesso Turkey

Deniz Avcı / R&D Engineer



- Adesso Turkey is part of the international Adesso SE group, a major IT service provider in Central Europe.
- We operate in 72 offices worldwide, with a strong focus on innovation and digital transformation.
- Our Turkey branch was established in 2013 and has become one of the top 3 fastest-growing IT companies in the country.

- We now have over 600 employees and continue expanding with new offices in ODTÜ Technopark and Technopark İzmir.
- We contribute to national and international R&D through TÜBİTAK projects, Eureka Cluster calls (such as ITEA and Celtic Next), and Horizon Europe initiatives.



ABOUT US -HAKKIMIZDA

ADESSO TÜRKİYE







3rd fastest growing IT company in informatics500



%500 growth

First Software Export



%100 growth

R&D Center



%130 growth

H2020 Above Threshold Award

1997

2013

2015

2016

2017

International Based Manufacturer/Manufacturer **Representative - Sectoral Softare Winner**

Sales: 61,46 MTL domestic 85,63 MTL abroad

R&D 250 Top 100 Firms



Sales: 51,33 MTL domestic 38,03 MTL abroad

Entry to top employers list

Informatics500 Mobile App **Revenues First Place**

Sales: 27,4 MTL domestic 27,5 MTL abroad



Sales: 15,59 MTL domestic 18,79 MTL abroad

2022

2021

2020

2019

2018

• 2023 - ODTÜ Technopark ve **Technopark İzmir Offices** opened

Sales: 139,75 MTL domestic 175,77 MTL abroad

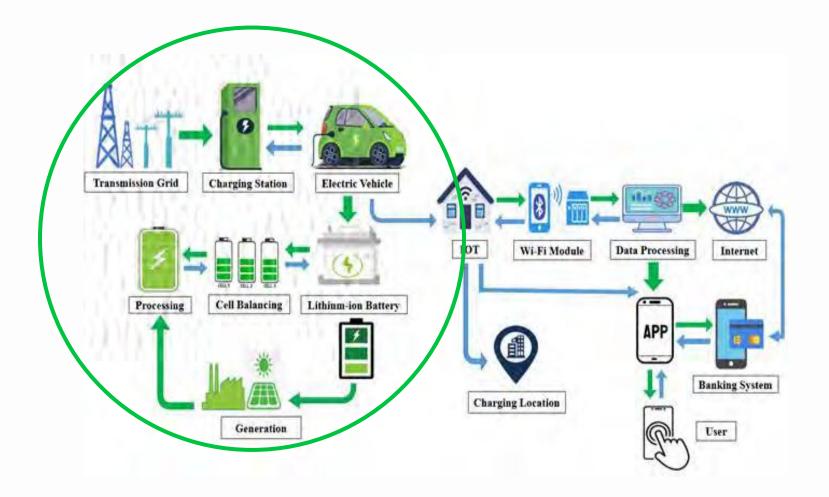
AXTool Award

The Best Artificial Intelligence **Project Article Award**



+600 employees +30 R&D Projects

2023 2024 2025



VISION

- Envisions the next generation of Battery Management Systems (BMS) by embedding an Al-driven layer that adapts charging and discharging strategies in real-time, based on the unique state of each EV's batteries and characteristics.
- create digital twins of EV batteries and power delivery systems, enabling continuous learning, predictive control and virtual testing. This approach not only extends battery life and range but also empowers drivers with userfriendly, real-time guidance/tips on driving, charging and battery health preservation through explainable AI techniques.
- if/when sufficient test vehicles are not available, the project will employ simulation environments to model, train, and validate AI models.
- Due to its marginal value, the project aims to focus on the battery management systems of EVs rather than other aspects of the vehicles.

ENVIRONMENTAL IMPACT

As the EU's **Green Deal** and **Fit for 55** impose stricter energy efficiency and CO₂ reduction targets, OEMs will need **non-hardware**, **cost-effective solutions** to improve sustainability metrics.

INNOVATION

Custom Charge / Discharge Regimes:

Personalized strategies tailored to realtime State of Charge (SOC), State of Health (SOH) and Remaining Useful Life (RUL).

Proactive Fault Detection:

Early anomaly detection algorithms to ensure safety and prevent costly failures.

01

02

03

04

05

Al layer for Conventional BMS:

Enhancing legacy systems with machine learning and predictive algorithms.

Digital Twin Framework:

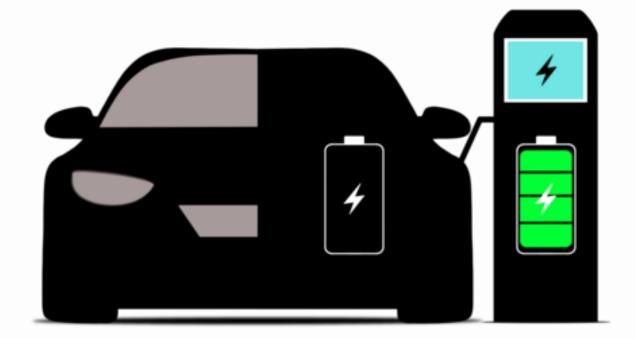
Virtual replicas of EV batteries and power delivery systems for continuous training and predictive testing.

Simulation Testbeds:

Virtual environments to compensate for limited physical testing fleets.

IMPACT

- Extended battery lifespan through AI optimized charging cycles
- Increased driving range without hardware changes.
- Predictive maintenance to reduce downtime and costs.
- Lower demand for battery replacements reduced e-waste
- Decreased carbon footprint by prolonging battery usage.
- Strong alignment with EU Green Deal and international climate goals.
- Reduced warranty costs for OEMs.
- Improved resale value of EVs.
- Creation of a first-mover advantage in AI-assisted, code level optimization for EV BMS.
- Real-time driving and charging tips to extend battery life.
- Increased trust and satisfaction in EV ownership.





PARTNERS: TURKEY







PARTNERS: SPAIN



POT.



PARTNERS: GERMANY



PARTNERS: PORTUGAL



POT. PARTNERS: UNITED KINGDOM





PARTNERS: REPUBLIC OF KOREA



Contact Details For any questions

Deniz Avcı

R&D Engineer Adesso Turkey Bilgi Teknolojileri Ltd. Şti. deniz.avci@adesso.com.tr

+905318353606

website: adesso Turkey

linkedin: adesso Turkey: Posts | LinkedIn