

TTIS Transport Technologies and Intelligent Vehicles Development and Application Center BATTERY RESEARCH & INNOVATION GROUP



OKAN ÜNİVERSİTESİ
İSTANBUL

OKAN UNIVERSITY TTIS BATTERY RESEARCH & INNOVATION GROUP



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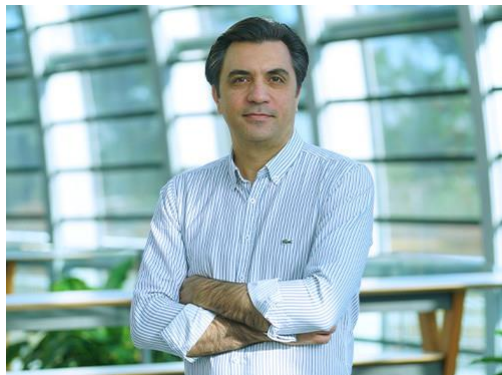
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Founder and CEO of INNODARE Inc.
Assoc. Member Automotive Engineering

- Hamdi Uçarol, Ph.D. Student
- Abdelmouanim Bensauer, MSc. Student
- Yousef Boukenna, MSc. Student
- Yousef AlHallaq, MSc. Student

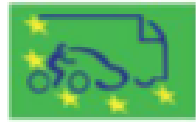


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MEMBERS OF ASSOCIATIONS



ERTICO-ITS, Intelligent Transport Systems and Services for Europe



EGVI
European Green Vehicles Initiative

EGVIA, European Green Vehicle Initiative Association



OTEP, Otomotiv Teknolojileri Platformu



AUSDER, Akıllı Ulaşım Sistemleri Derneği



CCAM, European Partnership on Cooperative Connected and Automated Mobility

BEPA, Batteries European Partnership Association

Calls of interest

HORIZON-CL5-2025-04-D2-01: Development of Sustainable and Design-to-Cost Batteries with (Energy-)Efficient Manufacturing Processes and Based on Advanced and Safer Materials (Batt4EU Partnership)

HORIZON-CL5-2025-02-D2-02: Cost-effective next-generation batteries for long-duration stationary storage (Batt4EU Partnership)

HORIZON-CL5-2025-04-D2-05: Accelerated multi-physical and virtual testing for battery aging, reliability, and safety evaluation (Batt4EU Partnership)



RESEARCH INTERESTS

Studies on State of Health (SoH)

1. Cell kinetic parameters were obtained by **electrochemical impedance spectroscopy (EIS)** method. The changes in circuit parameters were analysed theoretically in cases of forced charging and discharging. It was seen that, classical cell models were not sufficient to mirror the irreversible effects on Li-ion polymer cells caused by improper charging and discharging procedures.,
2. The prediction of the SoH of lithium batteries by using the "Incremental Capacity and Delta Voltage (IC/DV) method under an MSc. Thesis, (2021), BAYDAN S. "A Study on the SOH Estimation Methods of Lithium-ion Batteries", İstanbul Okan University Power Electronics and Clean Energy Technologies MSc. Program.
3. In a recently completed MSc.Thesis, the various AI methods for predicting the SoH of LiFePO_4 cells have been studied. It is shown that Long Short-Term Memory (LSTM) method is superior over Deep Neural Network (DNN), Recurrent Neural Network (RNN), and Convolutional Neural Network (CNN) methods.
4. Currently the characterisation of LiNa cells are under study by using **EIS technique**. Changing the equivalent circuit parameters and predicting the SoH for harsh charging and discharging conditions.

THIS IS STILL UNDER STUDY



PROJECTS

Project Name	Call Type, Years	Participation	Budged	Results
Moduler and Intelligent Battery Management System	TÜBİTAK, 1003 Priority Topics Call, National Project 2015-2017	R. Nejat TUNCAY Project Coordinator	229209 TL Average Rate for 2016=3.30, Approximately 70 000 Euro	Completed 2017
Development of an Energy Management System for a Fork Lift, Energised by the Li-Ion Battery and Super Capacitor	TÜBİTAK, 1505 Industry-University Collaboration Call, Between OKAN University MUTLU AKÜ Co. 2022-2024	R. Nejat TUNCAY, Ömer Cihan KIVANÇ, Semih BİLGİN, Cem Hakan YILMAZ, M. Anıl ÖZCAN	717.966 TL TL Average Rate for 2022=17, Approximately 42 000 Euro	Completed 2024
NEXTGEN4BATT, Next-Generation Technologies for Battery Management	Call HORIZON CL5-2022-D2-O1 Activity CL5-2022-D2-01-09 2022-2025	RISE Sweden and 13 European Institutes and Universities including Okan University	Total 4,999,125 Euro Okan University Share 312,500 Euro	Not Supported Total score: 11.00 above threshold: 10



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Open to discussions & one-on-one meetings

****Let's connect & explore synergies!****

Available for follow-up meetings via the platform

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[<https://www.okan.edu.tr>]**