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Capgemini collaborates with leading experts from the Technical University of Munich to integrate AI in sustainable battery design for electric mobility

New collaboration will build methods and tools for virtual battery modeling and development including cell level simulation to help optimize sustainable battery design and related management systems

Paris, September 15, 2023 - [Capgemini](#) announced today the launch of a research collaboration with the Chair of Electrical Energy Storage Technology at the Technical University of Munich ([TUM](#)), to develop Artificial Intelligence solutions to optimize sustainable advanced virtual battery design.

Electric mobility and vehicles are key elements to aid the fight against climate change, but battery design and related management systems remain a challenge for the industry. In particular, performance, cost, aging and safety optimization of battery cell systems remain a crucial area of research. A better understanding, modeling, and simulation of the physical properties of battery cells will significantly improve their performance while reducing the time and costs associated with sustainable battery research.

This new research program with the Chair of Electrical Energy Storage Technology at TUM is part of Capgemini's Strategic University Program, a key initiative with the primary objective to co-invest with world-class universities to produce high quality research outputs that contribute to answer the question "What are the key challenges of a more intelligent industry in our society?" These deeply collaborative projects, where Capgemini experts work alongside leading academics, aim to contribute to the advancement of engineering in a three-to-five-year research horizon. They are designed to harness the power of technology and enhance capabilities in Intelligent Industry¹.

The collaboration between Capgemini and TUM will focus on the development of AI-based parameter simulation for lithium-ion battery systems. The purpose will be to significantly speed-up and optimize battery design to improve product performance: modeling and simulating electrochemical-thermal couplings, identifying the right materials, and reducing the use of materials, all to help ensure the best cell design and integration in battery packs.

"Advanced battery models in combination with AI and optimized control enable a cost-, age-, and safety-optimized operation of lithium-ion batteries. Most challenging and time consuming is the parameter identification for these models. The non-invasive parameter identification methods we develop through this new collaboration have the potential to reduce time and effort drastically and enable us to use advanced battery models within highly optimized battery applications", explained Professor Dr. Andreas Jossen, Head of Chair of Electrical Energy Storage Technology, at TUM.

"We are thrilled to launch a new research program with leading experts from TUM, a world-class university in technology and engineering, to further inform and enhance our capabilities in Intelligent Industry. It is

¹ 'Intelligent Industry' is the new era of digital transformation: characterized by a growing convergence of the physical and virtual worlds - product, software, data, and services - across all industries; and fueled by the rapid development of technologies, including cloud, artificial intelligence (AI), internet of things (IoT), edge computing and 5G.



essential to accelerate on sustainable battery design to develop electric mobility. Thanks to this new collaboration and our expertise in batteries, AI and multi-physics simulation, we are aiming to create advanced engineering designs, a key lever to reach sustainability objectives”, stated William Rozé, CEO of Capgemini Engineering and Group Executive Board Member.

About Capgemini

Capgemini is a global leader in partnering with companies to transform and manage their business by harnessing the power of technology. The Group is guided every day by its purpose of unleashing human energy through technology for an inclusive and sustainable future. It is a responsible and diverse organization of nearly 350,000 team members in more than 50 countries. With its strong 55-year heritage and deep industry expertise, Capgemini is trusted by its clients to address the entire breadth of their business needs, from strategy and design to operations, fueled by the fast evolving and innovative world of cloud, data, AI, connectivity, software, digital engineering, and platforms. The Group reported in 2022 global revenues of €22 billion.

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