

**CARISSMA**Institute of Electric,  
Connected and Secure MobilityTechnische Hochschule  
Ingolstadt

## Abschlussarbeit

### “Battery test matrix optimization to reduce battery test time and cost”

#### **Beschreibung:**

The process of testing batteries is an expensive and time-consuming process. This process is often accomplished by trial and error. Fortunately, there are test protocols that can be used to validate the design. However, this approach is very slow and expensive because there are hundreds of protocols you need to test, and each experiment takes weeks to months to complete. The novelty of this thesis is to find the test protocols that maximize battery lifetime, performance, safety or reliability. The researcher may choose to optimize the test matrix for each of these test categories. This means finding the optimal combination of test parameters to maximize battery life, safety, performance, and reliability. For this, we will consider several critical test protocols in a defined time. The algorithm must be efficient in order to avoid tests that are likely to have a short lifespan, and we also want to ensure that we don't miss good tests that are very different from the ones we've tested before. The method should also avoid expensive and time-consuming testing protocols and tell us the most valuable protocols that are cheap and fast.

#### **Ihre Aufgaben:**

- First Phase: Battery cell acquisition. Definition of experiments.
- Second Phase: Model development based on data or semi-empirical.
- Third Phase: Writing the text document of the thesis, representing/presenting the results.

#### **Ihr Profil:**

- MatLab or Python experience and knowledge are desirable but not required.
- Confident use of MS Office.
- Ausgeprägte Kommunikations- und Organisationsfähigkeiten.

#### **Interesse? Fragen? – Kontaktieren Sie uns!**

#### **Kontakt:**

Carlos Antônio Rufino Júnior

E-Mail: carlos.rufino@carissma.eu

Prof. Dr. Hans-Georg Schweiger

Hans-Georg.Schweiger@thi.de