Press release

SEMIKRON Foundation and ECPE honour a team from Finland with the Innovation Award 2020 while this year's Young Engineer Award goes to Johannes Büdel.

March 25th, 2020

This year the jury has decided to give the SEMIKRON Innovation Award to a research team from **Aalto University in Espoo, Finland** comprising **Prof. Dr. Marko Hinkkanen, Dr. Seppo Saarakkala, Maksim Sokolov and Reza Hosseinzadeh** for their joint work on an ´**Bearingless Linear Motor Drive for Future Transportation Systems**´.

The research team from Aalto University has developed and experimentally tested a novel magnetically levitated linear propulsion system. The system is based on a four-sided arrangement of eight individually controlled three-phase flux-switching permanent magnet (FSPM) linear motors. After developing a real-time control algorithm for this system, a robust levitation in six degrees-of-freedom could be achieved, while using the same linear motors for producing the thrust force for the propulsion. The system can be used in both horizontal or vertical movement applications providing a completely contactless linear movement along a fixed rail. Contactless operation allows frictionless, lubrication-free and maintenance-free operation with no mechanical wear, reduced polluting, long lifetime, and low vibration. The developed innovation demonstrates the use of integrated magnetic levitation for sustainable and energy-efficient transportation technologies with the key advantage of passive rails without magnets or excitation coils. Furthermore, the innovation is applicable in various systems benefitting from mechanically contactless linear movement, e.g. for ropeless multi-car elevators

The SEMIKRON Young Engineer Award 2020 goes to Johannes Büdel from **Technische Hochschule Aschaffenburg, Germany** for his work on a ´**Dual Two-Level Inverter for Safe, Reliable and Highly Efficient Operation of Machines with Superconductive Stator Windings**´ supervised by Prof. Dr. Johannes Teigelkötter.

With zero electrical DC resistance and the high current densities, superconductors are suitable for electrical machine applications. In particular, superconducting motors are attractive for mobile traction drives for sea transport and aviation where high power levels of several MW per motor are required e.g. for large aircraft propulsion.
Johannes Büdel has contributed to the development of a dual two-level inverter for safe, reliable and highly efficient operation of machines with superconductive stator windings. The novel inverter topology offers the possibility to control and diagnose a

superconductive electrical machine. The set-up decreases the superconductive losses to a minimum, while fully utilizing the superconductive tapes. This leads to a reduction of cryogenic cooling equipment. Especially for aircraft application, the resulting lower weight will improve efficiency in operation.

About the SEMIKRON Foundation:

The SEMIKRON Foundation was founded on December 4, 2010, by owners of the SEMIKRON Group. Equal founders are the daughters of Peter Martin, the SEMIKRON owner and managing director of many years, who passed away in 2008. With the founding act, the founders intended to live up to their responsibility being the owners of a family-owned medium industry business and to contribute to their company's "Corporate Social Responsibility".

The purpose of the SEMIKRON Foundation is to bundle and extend the charitable activities operated by the owners of the SEMIKRON Group. In particular, the humanitarian projects initiated by Mr. Peter Martin, and supported by the Mali Martin Care e.V. charity are to be continued. These projects support children and people in need all over the world. Over the past 10 years, Mali Martin Care e.V. has donated more than one million Euro to humanitarian projects for children and young adults, mostly in Brazil (projects "Centro Social" and "Lar do Menor"). In addition, the foundation supports research projects and innovations in the field of power electronics. For more information, please visit: www.semikron-stiftung.com.

Contact:
Rechtsanwalt Dr. Felix Hechtel
SEMIKRON-Stiftung
Sigmundstraße 200
90431 Nürnberg
Tel: 0911/6559-0
E-Mail: felix.hechtel@semikron-stiftung.de

Press Contact:
Werner Dorbath
SEMIKRON-Stiftung
Sigmundstr. 200
90431 Nürnberg
Tel: +49-(0) 911-6559-217
Mobile: 0049/(0) 176 30086217
werner.dorbath@semikron.com

Contact:
ECPE European Center for Power Electronics e.V.
Bayerischer Cluster Leistungselektronik
Dipl.-Phys. Thomas Harder, Geschäftsstellenleiter und Clustergeschäftsführer
Landgrabenstraße 94
D-90443 Nürnberg
Tel: 0911/810288-11
Fax: 0911/810288-28
E-Mail: thomas.harder@ecpe.org