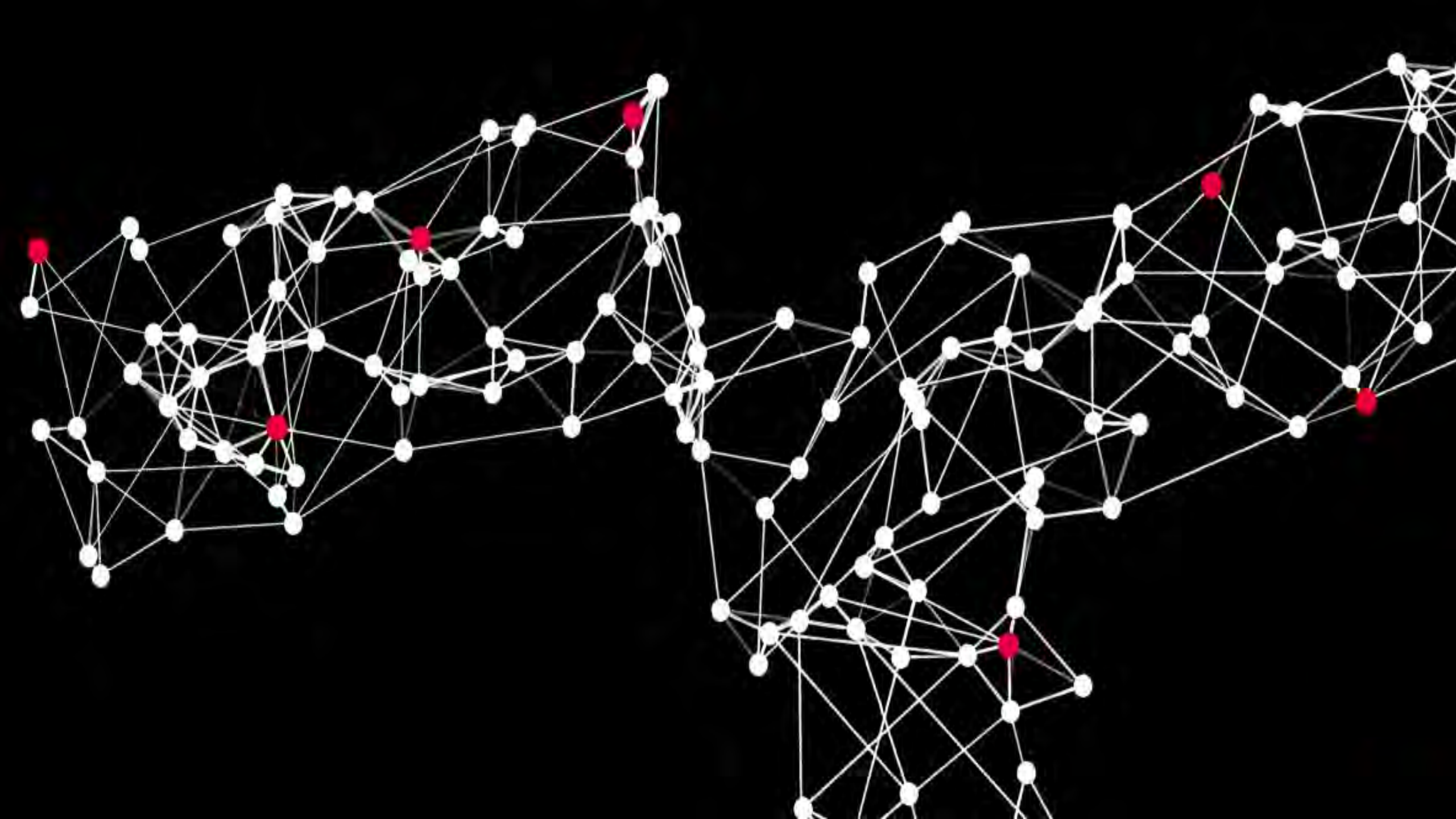


Easter morning 1900 5th AVE, New York City.

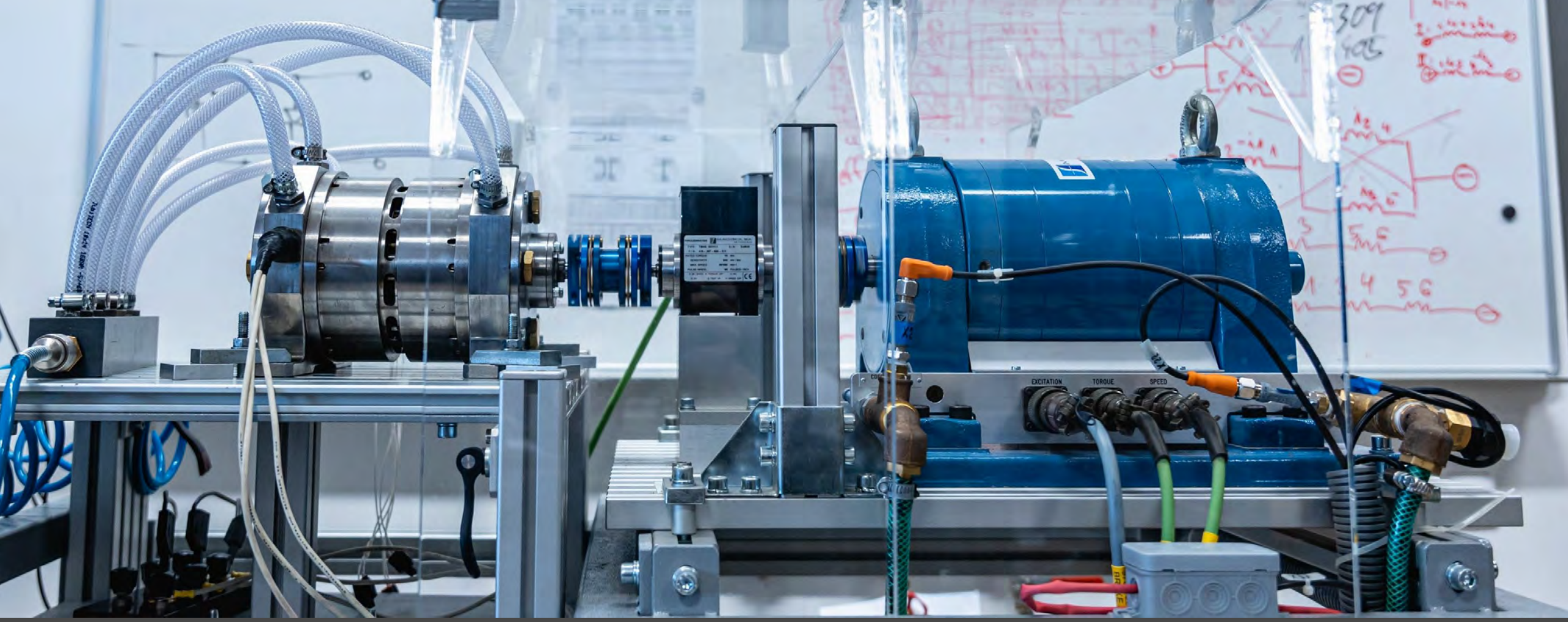
Easter morning 1900 5th AVE, New York City.

Easter morning 1913 5th AVE, New York City

Easter morning 1913 5th AVE, New York City

What will be future of our transportation in 13 years?

What will be our future of transportation in 13 years?



Research group of Electrical Machines at BUT

BRNO UNIVERSITY OF TECHNOLOGY

FACULTY OF ELECTRICAL ENGINEERING AND COMMUNICATION

department of power electrical and electronic engineering

Internationally recognized research of Electrical Machines

Growing Strong Together: Cooperation between the JKU and the University of Brno

The 4-year partnership between the JKU and the University of Brno has proven to be very successful.

NEWS

Published on
November 05, 2021

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JKU partnership with Brno

Initiated by Dr. Barta (BUT) and Dr. Bramerdorfer (JKU), the partnership between the Brno University of Technology (BUT) and the JKU has been going strong since 2018. The two universities are working together on, among other things, new methods to optimize electrical machines and new machine topologies. The main objectives include increasing efficiency while simultaneously minimizing the use of resources (sustainability) and costs (reducing costs often goes hand-in-hand with reducing resources).

The partnership is already impressively broad and growing exponentially, also reflected in the number of joint research activities, publications and jointly supervised graduate degree theses. Most recently, the University of Brno became a scientific partner at the K2 Center, coordinated by the Linz Center of Mechatronics.

Kooperation der JKU mit Uni Brünn ausgebaut

Internationale Forschungen und Publikationen

LINZ. Bereits seit dem Jahr 2018 kooperieren die Brno University of Technology (BUT) in Tschechien und die Linzer Johannes Kepler Universität. Die Initiative wurde damals von Jan Barta (BUT) und Gerd Bramerdorfer vom Institut für Elektrische Antriebe und Leistungselektronik (JKU) ins Leben gerufen.

Gemeinsam arbeiten die beiden Universitäten unter anderem an neuen Verfahren für die Optimierung von elektrischen Maschinen beziehungsweise auch an neuen Maschinentopologien.

Stärker und sparsamer

Das Hauptziel der Kooperation ist die „Wirkungsgradsteigerung bei gleichzeitiger Minimierung des Ressourceneinsatzes". Elektrische Maschinen sollen sowohl leistungsfähiger als auch ressourcenschonender werden. Zusätzlich sollen auch die Produktionskosten derartiger Maschinen verringert werden.

Der Umfang der Zusammenarbeit ist bereits eindrucksvoll groß geworden und wächst kontinuierlich. Dies spiegelt sich einerseits in der Anzahl an kollektiven Forschungsaktivitäten der beiden Universitäten, andererseits in internationalen Publikationen und gemeinsam betreuten Masterarbeiten wider.

Die Universität aus Brünn konnte jüngst dadurch auch als wissenschaftlicher Partner fürs K2-Zentrum, koordiniert durch das Linz Center of Symbiotic Mechatronics, gewonnen werden.

Energie sparen im Haushalt: Brünner Forscher entwickeln verbrauchsarmen Motor für Elektrogeräte

20.12.2023

Energie sparen im Haushalt: Brünner Forscher entwickeln verbrauchsarmen Motor für Elektrogeräte

Länge 3:08

Einzigartige Einphasenmotoren von FEKT VUT mit Dauermagneten | Foto: Václav Koníček, Technische Hochschule Brno

Moderne Elektrogeräte im Haushalt helfen dabei, das Klima zu schützen. So entwickeln etwa Wissenschaftler aus Brno / Brünn Motoren für Waschmaschinen, Kühlschränke und andere Geräte, die den Energieverbrauch deutlich einsparen können.

Der Stromverbrauch wächst – weltweit und auch in Tschechien. Einsparungen für Privathaushalte zu ermöglichen, das haben sich darum Wissenschaftler an der Fakultät für Elektrotechnik und

Research group of Electrical Machines at BUT

A sustainable and energy-efficient world of the future

E-Mobility

- E-motors and generators for all modes of transportation
- High-speed machines for fuel cell compressors
- High-speed machines for cooling compressors

Energy

- Generators for power generation
- High-speed motors for compressors designed for fusion reactor cooling

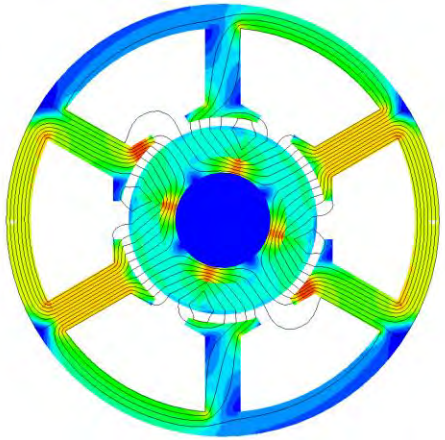
Households and industry

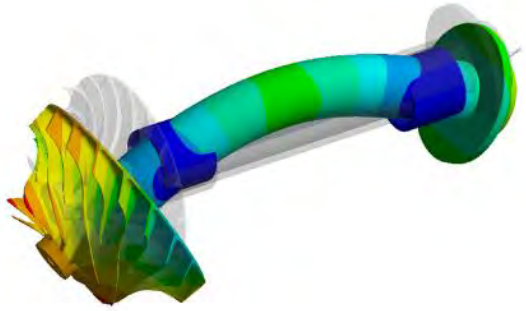
- High Efficient Variable speed drives
- High-speed machines for tubro compressors
- High efficciency machines for industry and households

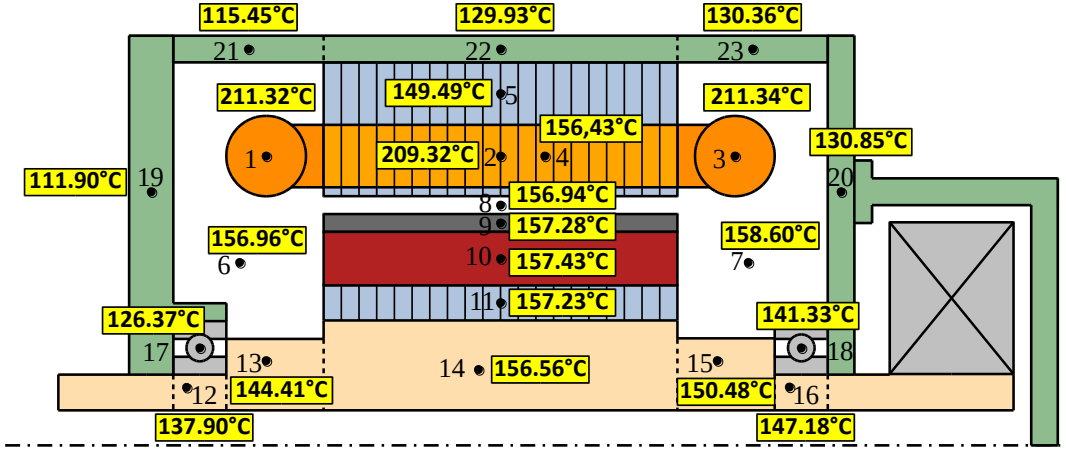
Key Competences I

Analysis of electromechanical systems

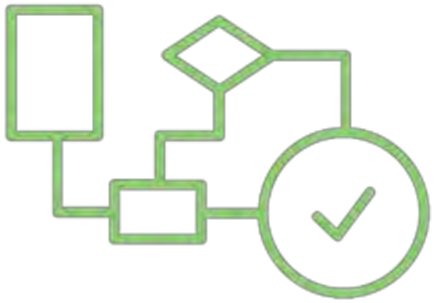
Electromagnetics, thermal, mechanical

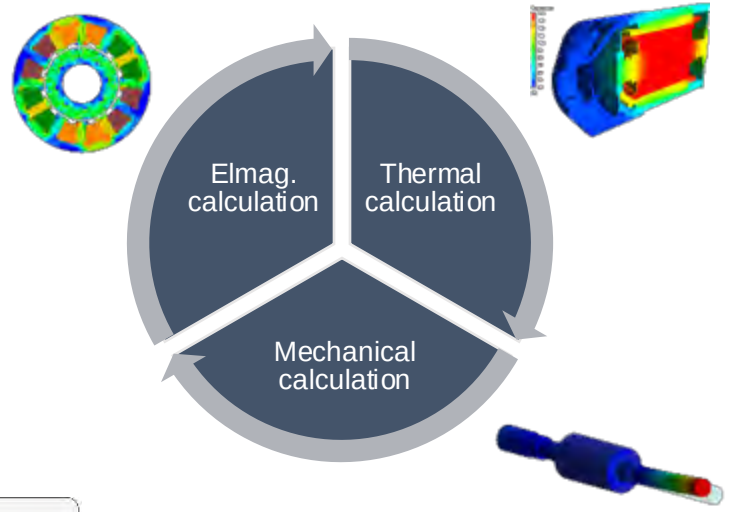


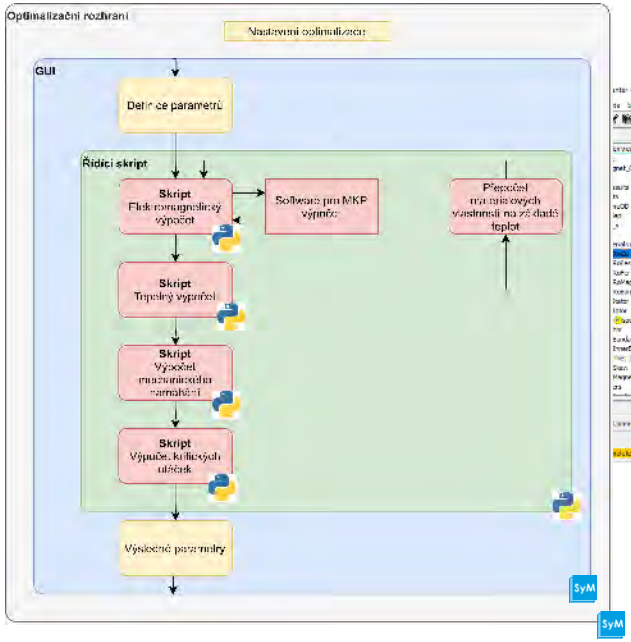


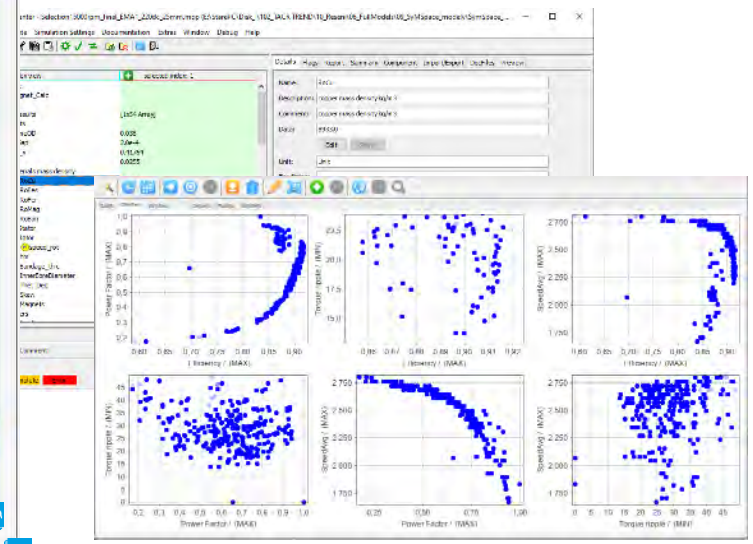


Multidisciplinary design approach





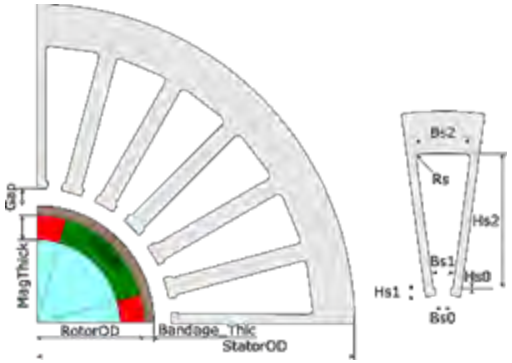


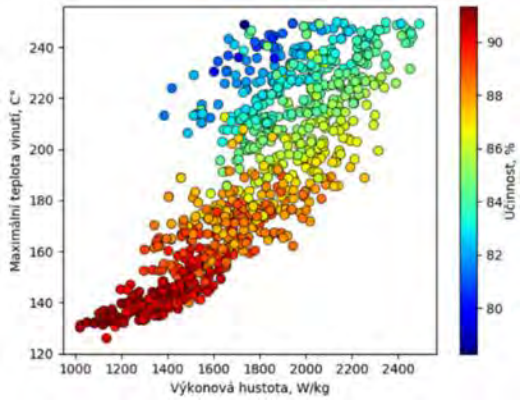


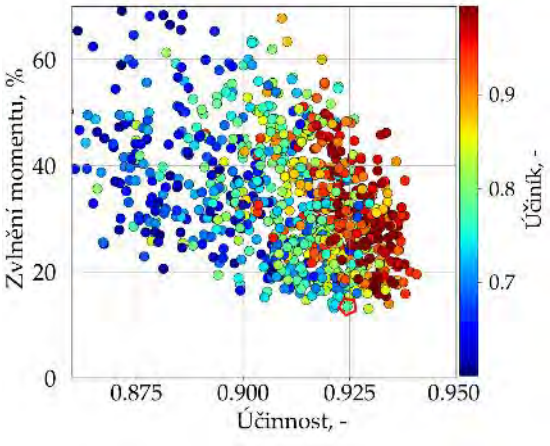
Key Competences II

Multiobjective optimization methods

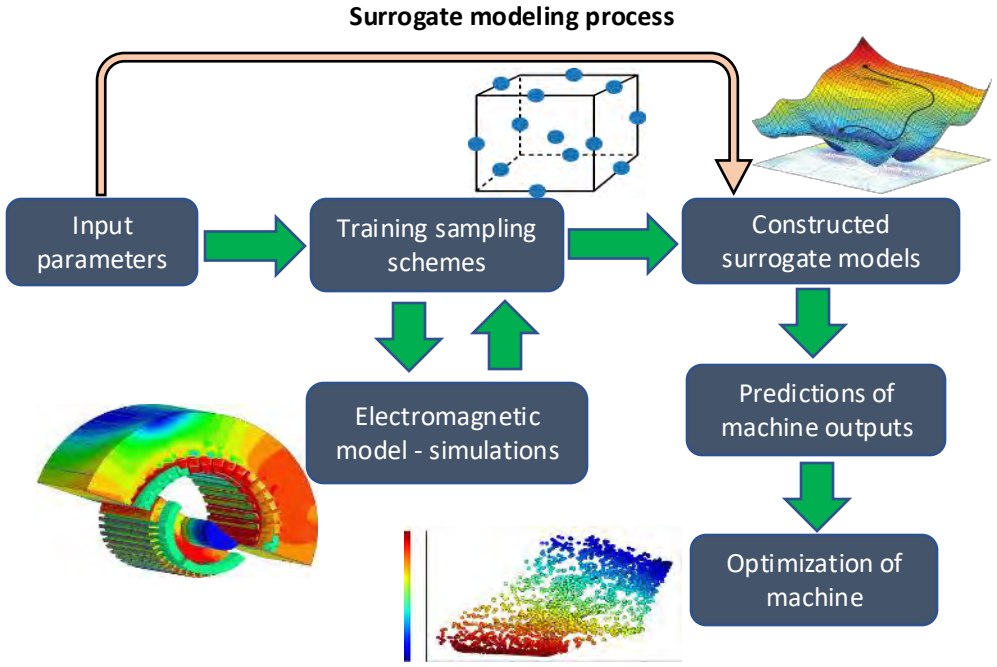
combination of elements of a differential evolution (DE), Strength Pareto Evolutionary Algorithm 2/non-dominated sorting genetic algorithms II (SPEA2/NSGA-II)

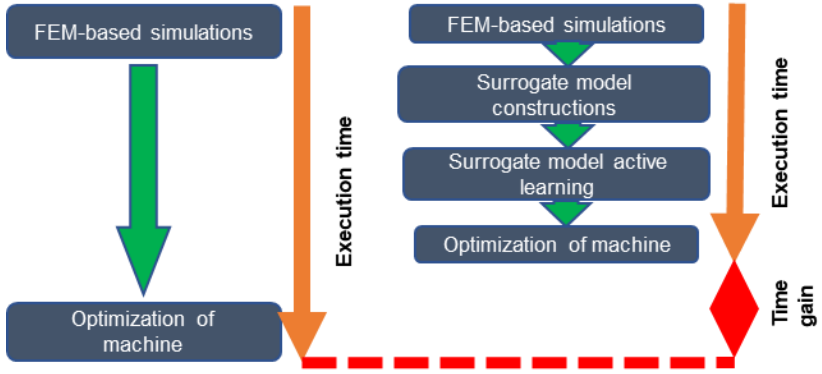




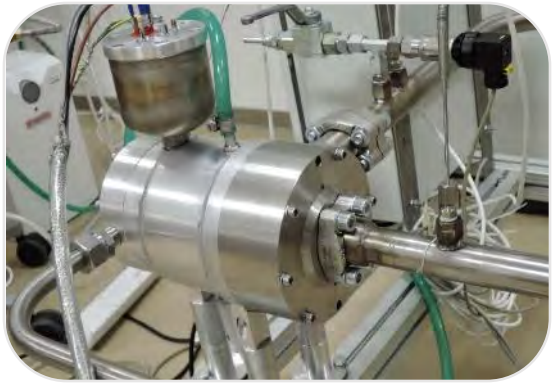


Utilization of surrogate modelling



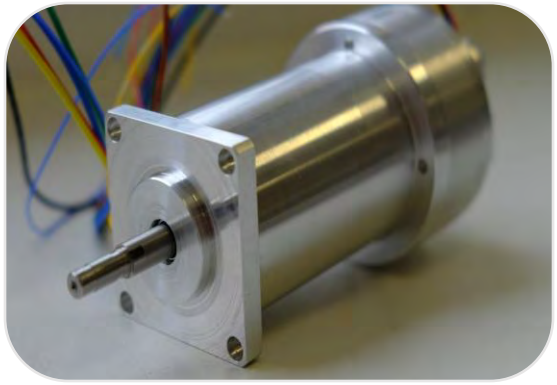


Example of Prototyped Machines

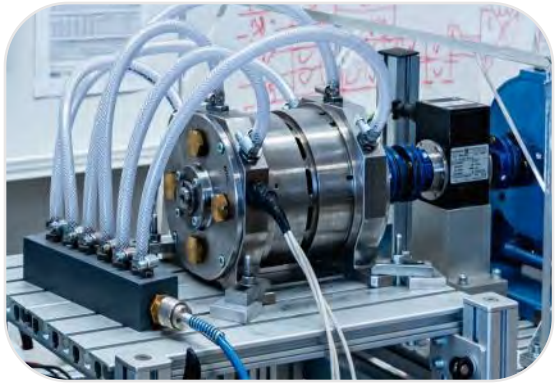


Squirrel cage Induction machine for turbo-circulator

6 kW at 120 000 rpm

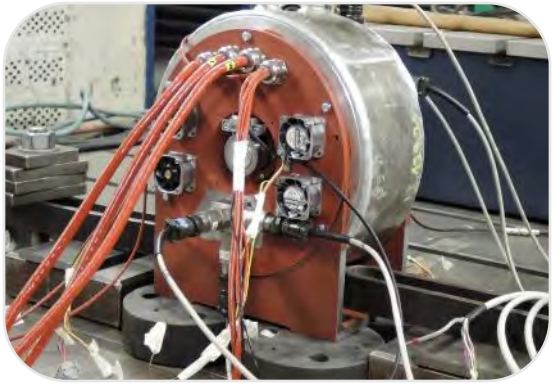


250 W, 15 000 rpm PMSM for areospace



Slitted rotor Induction machine

12 kW at 50 000 rpm



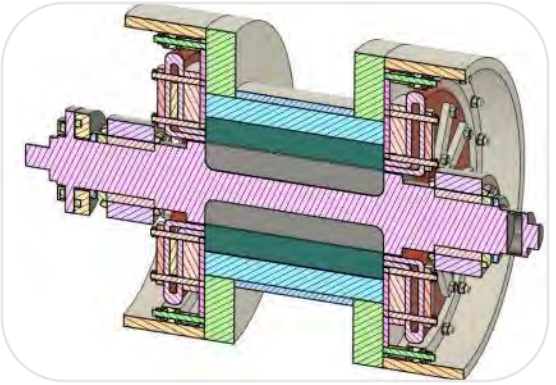
Squirrel cage Induction machine

50 kW at 50 00 rpm

Fault tolerant PMSM for UAVs

Addively manufacture SynRel

Coated rotor test sample for verification of surface speed up to 300 m/s



Induction machine for TC

10,5 MW at 9000 rpm

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JOHANNES KEPLER UNIVERSITÄT LINZ

TU Delft
Delft University of Technology

Politecnico di Torino

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Thank you for your attention

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Department of Power Electrical and Electronic engineering

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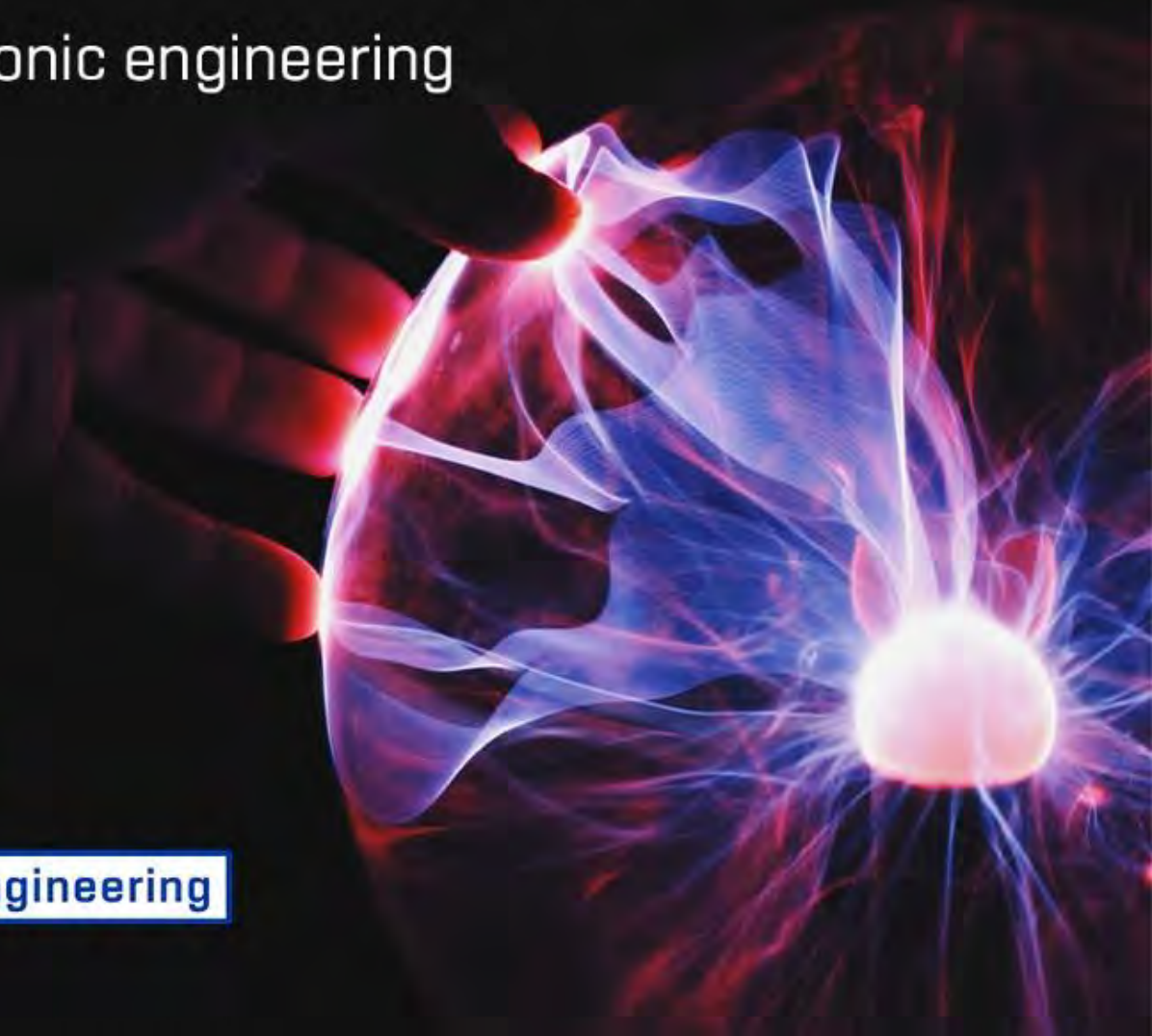

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