PhD thesis offer (CIFRE)

Optimal Design of modular high performance BWRSM (Brushless Wound Rotor Synchronous Machine) for embedded systems

Company: MITSUBISHI ELECTRIC R&D CENTRE EUROPE
1 allée de Beaulieu, CS 10806, 35708 Rennes Cedex 7, France
Web site: http://www.mitsubishelectric-rce.eu/

Contract type: 3 years determined term period (CDD), September 2015
Reference: PES_PhD_2015006

Context and description:

Mitsubishi Electric R&D Centre Europe (MERCE) is the European R&D centre from the Corporate R&D organisation of Mitsubishi Electric. The aim of our centre is to provide advanced R&D support to the Japanese R&D centres and to the business units of Mitsubishi Electric Corporation.

Situated at the heart of Europe's leading R&D community, MERCE includes two entities: MERCE-France and MERCE-UK, and conducts R&D into next generation communication systems and technologies related to Energy and Environment. MERCE is reinforcing its activities with regards to high efficiency high density electrical machines and high performance drives.

Organization:

The thesis is within the scope of a CIFRE collaboration with Laboratoire Laplace in Toulouse. Most of the work (approx. 75% of time) will be conducted in Laboratoire Laplace under the supervision of a Electromagnetic and Electrical Machines Researcher and within the “GREM3” team. The work will make use of the facilities available on the Laplace laboratory and will be within the scope of the GEET doctoral school of Toulouse. The position includes frequent visits in MERCE in Rennes (remaining 25% of time).

Thesis description:

The objectives of the thesis are to benchmark, design, model, prototype and evaluate a Modular BWRSM with power electronics modules integrated into the Stator and Rotor. The applications targeted with this machines are HVAC (Heating, Ventilation, Air Conditioning) and EV (Electrical Vehicles) [1,2,3,4].

The thesis will therefore require the following steps and tasks:

- Literature survey: Conduct a State of art search on Design and sizing of WRSM (Wound Rotor Synchronous Machines). Focus on Brushless machines, modular machines, integration of
power electronics components into stator and rotor. Covering the fault tolerant aspect as well.

- Specification and analysis of the machine structure and definition of the sizing and optimization problem
- Sizing and Optimisation
- Prototyping and experimental validation
- Project report and presentation.

Essential qualifications / personal profile:

- Recently graduated Engineer with a background in Electrical machines, Electromagnetic Modelling and optimization.
- Interest and experience in experimental realizations and / or tests;
- Fluent English
- Excellent communication skills;
- Motivation and dynamism to work in a research environment adapted to industry;
- Open-mindedness, capacity to work in a multicultural and international environment;

Contact:

Mme Magali BRANCHEREAU (Human Resources Manager)

Please send CV and motivation letter by email (indicating in object: your name + reference of the offer) to:

jobs@fr.merce.mee.com.

Deadline to apply: the 30th of June 2015.

References:

