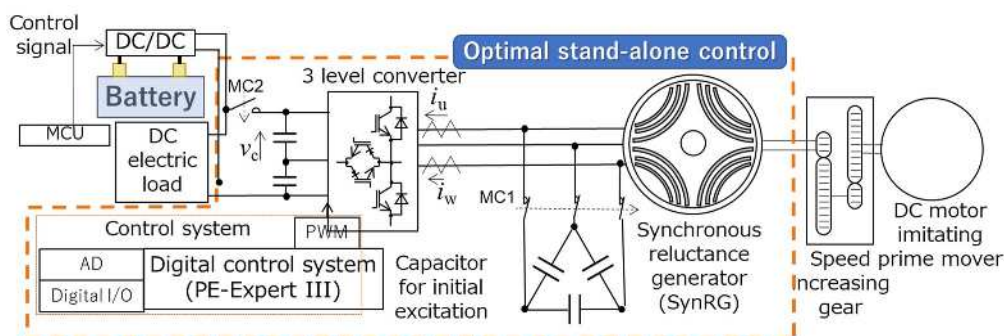


Name	DAIDO Tetsuji	Job Title	Assistant Professor	Area of Expertise	Motor Drive, Power Electronics
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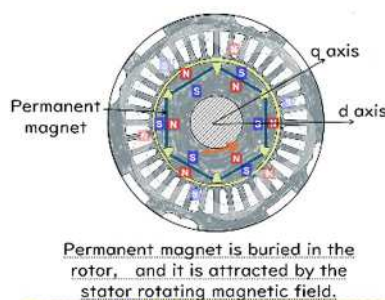
1. Main Research Topics

① Control of a high-efficiency distributed generation system using synchronous reluctance generators



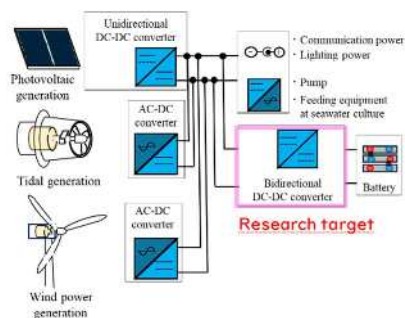
Synchronous reluctance generators (SynRG) do not incorporate rare-earth materials, thereby eliminating concerns related to the stability of their raw material supply. In addition, it is free from thermal demagnetization and its maintenance is easy. In recent years, the application of detailed finite element method analysis has significantly enhanced both the efficiency and power factor of SynRG. The conventional control method for SynRG uses the equivalent electrical circuit of SynRG. However, this equivalent circuit cannot consider local magnetic saturation, which reduces the prospected performance of SynRG. Therefore, this study considers an equivalent circuit that considers local magnetic saturation. This study aims to improve the maximum torque per ampere control of the SynRG.

② Encoder-less IPMSM control by means of PWM carrier -synchronized high frequency signal voltage injection



Pulse width modulation (PWM) carrier-synchronized with high-frequency signal voltage injection is a method for estimating the rotor position at a standstill and very low speed. This study has proposed a novel compensation method for the nonlinear voltage distortion of a voltage source inverter. In light of the recent advancements in microprocessor capabilities, this study investigates the application of minor sampling techniques to enhance the accuracy of rotor position estimation.

③ Designing and producing a non-isolated DC/DC converter for a battery energy storage



Offshore standalone power supply systems that exclusively utilize renewable energy sources require batteries to maintain a balance between power generation and consumption. The efficient regulation of battery charging and discharging is dependent on the use of a DC/DC converter. This research is centered on a non-isolated DC/DC converter, with its design and fabrication being conducted independently.

2. Keywords

Motor drive, Semiconductor power conversion, Power electronics

3. Remarks and Websites

In my research, I employ both computer simulations and experimental setups. I place particular importance on independently designing and constructing these experimental setups.

researchmap: <https://researchmap.jp/pepep>

Laboratory (Japanese only): <http://www.eee.nagasaki-u.ac.jp/labs/asca/top.html>