

## DESIGN AND VALIDATION OF ACTIVE EMI FILTERS FOR MOTOR DRIVE SYSTEMS

(Any Theses)

The rapid growth of electric vehicles calls for motor drive systems that are not only efficient but also compact. Wide-bandgap devices such as SiC MOSFETs enable these compact and high-performance solutions, yet their fast-switching speeds generate significant electromagnetic interference (EMI). While conventional passive filters can mitigate EMI, they are often bulky and inefficient. This makes active EMI filters (AEFs) a promising key technology for the next generation of electric vehicle powertrains.

In this thesis, you will explore different **control strategies** and **implementation approaches** for AEFs, combining simulation with experimental validation on SiC-based drive systems. The main objective is to suppress EMI effectively while ensuring compliance with stringent automotive standards.

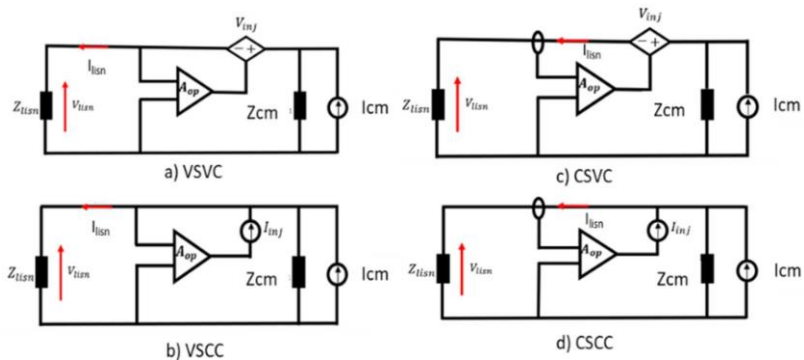


Fig. 1: Four active filter topologies. (a) Voltage sensing-voltage cancellation (VSVC). (b) Voltage sensing-current cancellation (VSVC). (c) Current sensing-voltage cancellation (CSVC). (d) Current sensing-current cancellation (CSCC)

Basic knowledge in power electronics is required. The exact scope of the work will be adapted to the requirements of the thesis and the student's background and interests.

Mentoring the thesis:

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