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Abstract
This thesis presents a digital three-phase electronic load emulation system with energy restoration. The system control strategy is based on DSP TMS320LF2407A microprocessor to achieve the function of load emulation and to restore the test power so that the consumption of testing system can be reduced.

The proposed architecture of the three phase electronic load emulator consists of two power stages, which are the AC/DC converter stage and the DC/AC inverter stage. The converter of both stages are regulated by conventional pulse width modulation (PWM) and operated in current-mode control. The AC/DC converter can be used to achieve the function of AC load emulation, including R, RL, and RC of load types. The DC/AC inverter is used to regulate dc bus voltage, and is operated in unit power factor.

To implement the proposed idea, a simple control algorithm and system design is presented in this dissertation. Case study for AC motor driver is demonstrated by means of prototype experiment to prove its performance and effectiveness.
Advisory Committee Ming-Tsung Tsai - advisor

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