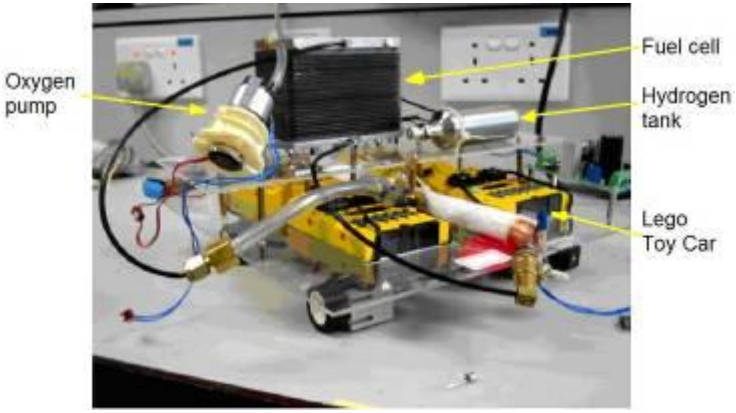
Design and Modeling of An Integrated Fuel Cell and Energy Storage System to Enhance Power System Performance and Reliability in Energy Storage Systems (PolyU 5245/04E)

(2004~2007)

Outcomes

- Developed a mathematic model of both dynamic and state-state for fuel cell
- Study fuel cell with magnetic energy storage
- Propose a new family of ZCS and ZVS power conditioners



Fuel cell vehicle

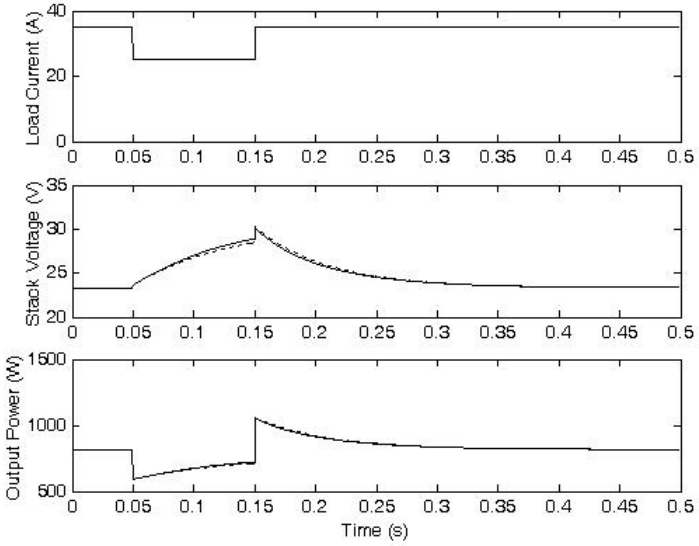
Published papers

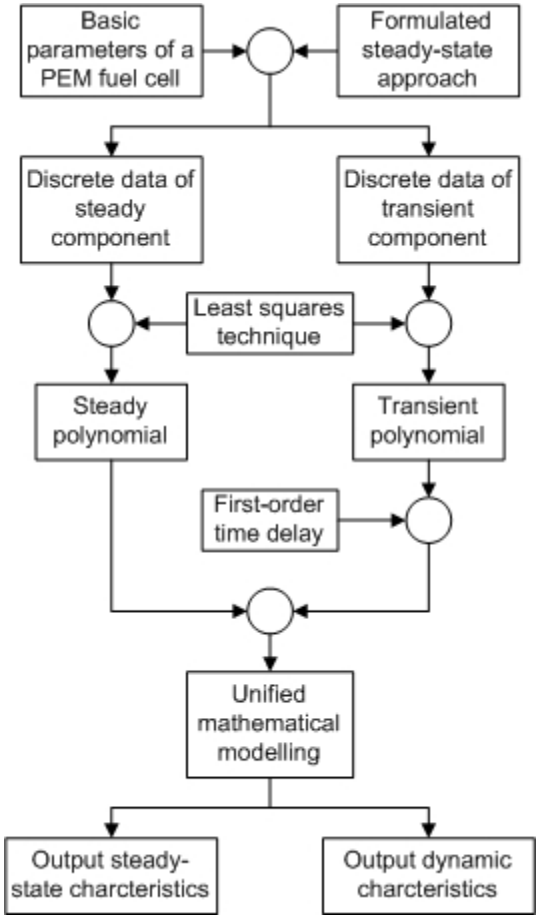
- 2 Journal papers
- 2 Conference papers

Unified Mathematical Modelling of Steady-State and Dynamic Voltage-Current Characteristics for PEM Fuel Cells

Electrochemical Acta

Developed a novel approach for optimization of the operating points of fuel cells and design of power conditioning units, simulators, and system controllers.



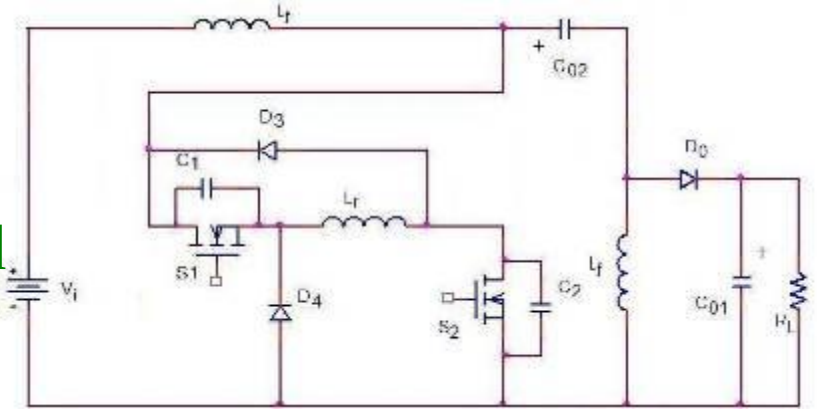


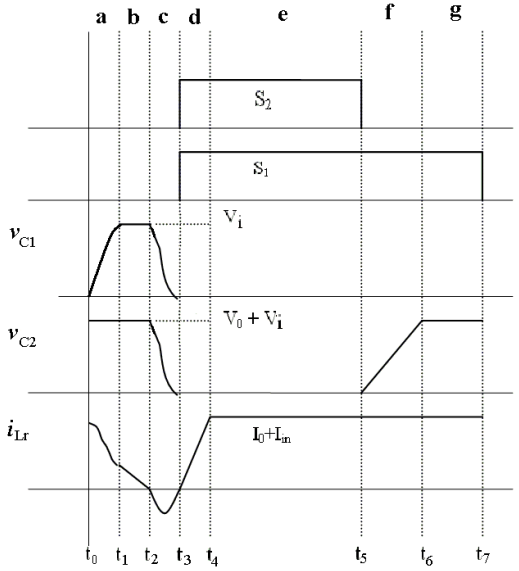
ZVS and ZCS Converters

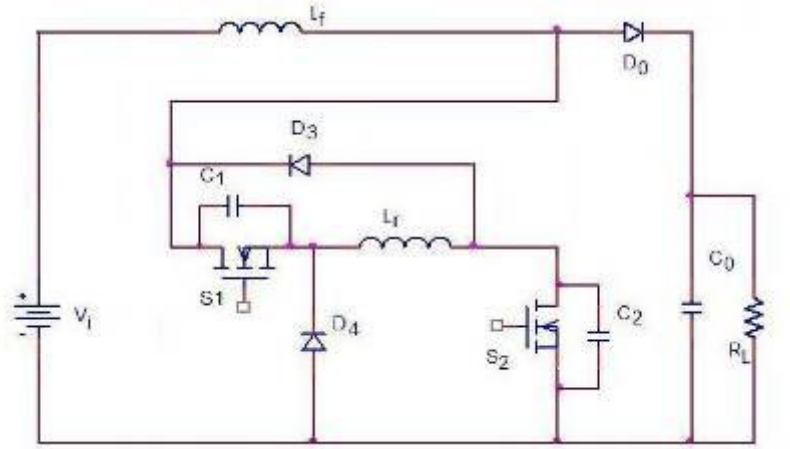
IET Power Electronics

1. Work well with fuel cells
2. Has been applied to fuel cell vehicle
3. Zero-current and zero-voltage switching are realized
4. Family of circuits developed

Zepic







Buck-boost