Proposal of Scientific Project for validating Benke

Title :

Incorporating every constraints into Energy Management strategy for an Hybrid Electric Vehicle

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Abstract :

The aim of this work is to apply an optimal Energy Management strategy that takes into account every constraints (pollutant emission, drivability, etc) at the same time for an Hybrid Electric Vehicle. The first step will be to build the simulator of the vehicle based on the experience of our lab. Next, the classical ECMS (Equivalent Consumption Minimization Strategy) will be implemented. Finally, the ECMS will be implemented to take into account every constraints at the same time. A focus on the pollutant emission will be done. The software used will be Matlab/Simulink.

Keywords: Hybrid Electric Vehicle, Energy Management strategy, Constraints, Optimal control, pollutant emission

References

- M. Debert, T. Miro Padovani, G. Colin, Y. Chamaillard (2012), L. Guzzella. Implementation of comfort constraints in dynamic programming for hybrid vehicle energy management. International Journal Of Vehicle Design, Vol. 58, 2/3/4, pp. 367-386
- T. Miro Padovani, M. Debert, G. Colin, Y. Chamaillard, Optimal Energy Management Strategy Including Battery Health through Thermal Management for Hybrid Vehicles7th IFAC International Symposium on Advances in Automotive Control (AAC), Tokyo, September 4-9, 2013
- P. Michel, A. Charlet, G. Colin, Y. Chamaillard, C. Nouillant, G. Bloch, Pollution Constrained Optimal Energy Management of a Gasoline, 11th International Conference on Engines & Vehicles (ICE), doi: 10.4271/2013-24-0083, SAE Technical paper # 2013-24-0083, Capri, Italy.
- L. Guzzella. and A. Sciarretta. Vehicle Propulsion Systems. Springer, 2004.

Required skills

Automatic Control, Optimal Control, Modeling, Matlab/Simulink