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Modelling and predicting energy consumption of a range extender fuel cell hybrid vehicle



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1	Modelling and predicting energy consumption of a range extender fuel cell hybrid
2	vehicle
3	Tao Zeng ¹ , Caizhi Zhang ^{1*} , Minghui Hu ¹ , Yan Chen ² , Changrong Yuan ³ , Jingrui Chen ³ , Anjian Zhou ^{3*}
5	¹ School of Automotive Engineering; The State Key Laboratory of Mechanical Transmissions;
6	Chongqing Automotive Collaborative Innovation Centre; Chongqing University; Chongqing,
7	China 400044
8	² Ira A. Fulton Schools of Engineering; the Polytechnic School; Systems Engineering; Arizona
9	State University; American, Mesa, AZ 85212
10	³ Changan Automobile Company Limited; Jiangbei District, Chongqing, China 400000
11	(* Corresponding authors at: C.Z Zhang, czzhang@cqu.edu.cn, Chongqing University; and
12	A.J Zhou, zhouaj@changan.com.cn, Changan automotive Company Limited)
13	Abstract
14	Energy consumption is an important economical index of a fuel cell hybrid vehicle (FCHV).
15	To analyse the energy consumption of a range extender FCHV and reduce the cost of
16	experiments, this study developed a nonlinear regression model of the powertrain of the vehicle
17	to predict the current and voltage on the DC bus, which were used in the investigation of energy
18	consumption, by using the intelligent algorithms including Back Propagation neural network
19	(BP), Genetic Algorithm-Back Propagation neural network (GABP) and least square support
20	vector machine (LSSVM). The model based on the LSSVM achieves the best predicted
21	performance and can consider the nonlinear characteristics of the powertrain quite well. A case
22	study was discussed by applying the obtained model and integrated with a hierarchical energy
23	management strategy (HEMS). The specific results of energy consumption showed that it is
24	feasible to use the predicted data of the obtained model in the analysis of the energy
25	consumption of the FCHV.

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