ANALYSIS AND DESIGN OF THE SPEED CONTROL FOR THE REGENERATIVE BRAKING SYSTEM

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ABSTRACT

THIS PAPER PRESENTS A NOVEL ELECTRICAL HARDWARE FOR THE SPEED CONTROL OF THE REGENERAT -IVE BRAKING SYSTEM.FIRST,WE DEVELOP A CHARGING AND DISCHARGING SYSTEM TO OPERATE BETWEEN A BATTERY AND A MOTOR. WHEN THE BATTERY ON THE CHARGING MODE, THE MOTOR OBTAINS ENERGY AND SPEEDS UP.THEN THE BATTERY ON THE DISCHARGING MODE, THE MOTOR CHANGES AS A GENERATOR,WHICH CAN TURN THE DYNAMIC ENERGY OF THE MOTOR TO ELECTRIC ENERGY.THIS ELECTRIC ENERGY IS DISCHA -RGED TO THE BATTERY. AND THUS MAKE THE MOTOR SPEED DOWN. THROUGH MODULATING THE RATIO OF THE TIME BETWEEN THE CHARGE AND DISCHARGE OF BATTERY, WE CAN PERFECTLY CONTROL THE SPEED OF THE MOTOR.MOREOVER,AS A RESULT OF THE ENERGY DISCHARGE OF THE MOTOR,THE BATTERY CAN CON -SERVE THE ENERGY CONSUMING. ADDITIONALLY,WE DESIGN TWO OF PI AND FUZZY CONTROLLERS FOR THE SPEED CONTROL OF THE MOTOR ,AND COMPARE WITH THEIR PERFORMANCE.THE RESULTS OF EXPERIMENT SHOW THAT THE FUZZY CONTROLL -ER HAS A LARGER OPERATING RANGE AND BETTER PERFORMANCE THAN THE PI CONTROLLER.

Keywords : REGENERATIVE BRAKING SYSTEM, FUZZY CONTROL, SPEED CONTROL

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