

A review paper on -E-Bike Motor Speed Controller

Chinmayi Satish Thakare

BE Electrical Engineering Final Yea

Jawaharlal Darda Institute of Engineering and Technology, Yavatmal, Maharashtra, India
cthakare002019@gmail.com

Abstract: *Speed control is not a prevalent feature found in electric bicycles. Many electric bicycles implement a pseudo speed controller that does not include feedback based on sensing speed. As with automobiles, speed control can be desirable for driver comfort and safety. Additionally, accurate speed control is also very helpful when validating dynamic models of single-track vehicles, which is our motivation. This paper describes a low cost feedback speed controller for an instrumented electric bicycle. To achieve this, we used gear box system identification to fit a second order linear model of the longitudinal dynamics of the bicycle to a measured step time response. The resulting fitted plant model was used to design a robust PID controller. We implemented the controller with a custom Arduino-based micro-controller.*

Keywords: bicycle, electric, control, speed, mechatronics

REFERENCES

- [1] R. Hess, J. K. Moore, and M. Hubbard, "Modeling the Manually Controlled Bicycle, " IEEE Transactions on Systems, Man, and Cybernetics - Part A: Systems and Humans, vol. 42, no. 3, pp. 545–557, May 2012.
- [2] J. P. Meijaard, J. M. Papadopoulos, A. Ruina, and A. L. Schwab, "Linearized dynamics equations for the balance and steer of a bicycle: A benchmark and review, " Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences, vol. 463, no. 2084, pp. 1955–1982, Aug. 2007.
- [3] S. W. Kresie, J. K. Moore, M. Hubbard, and R. A. Hess, "Experimental Validation of Bicycle Handling Prediction, " in Proceedings of the 6th Annual International Cycling Safety Conference, Davis, CA, USA, 2017.