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标题: INVESTIGATION OF FACTORS AFFECTING STEERING FEEL OF COLUMN ASSIST ELECTRIC POWER STEERING

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摘要: An application of electric power assist steering (EPAS) system has rapidly grown and overtaken hydraulic power assist steering (HPAS) system in recent automotive industry. The EPAS system has better fuel efficiency and potential application on vehicle dynamic control compared to HPAS. However, it is widely believed that the steering feel of EPAS system is inferior to HPAS system due to its mechanical construction.

This paper first presents a comprehensive model of column electric power assist steering (CEPAS) system consisting of steering wheel, worm gear, assist motor, intermediate shaft, and rack and pinion. In this model, the friction in steering system is modeled by LuGre friction model and basic control strategies are also implemented. Using the proposed CEPAS model, the steering feel responses have been investigated with varying system parameters through simulation, and important factors affecting the steering feel response have been identified. This result gives insights on how the steering feel is affected by various factors and can be useful to improve the steering feel control algorithm design.

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