

Visualization of CVT Transmission Mechanics

By

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• **STATEMENT BY THE AUTHOR**

I hereby declare that this submission is my own work and to the best of my knowledge, it contains no material previously published or written by another person, nor material which to a substantial extent has been accepted for the award of any other degree or diploma at any educational institution, except where due acknowledgement is made in the thesis.

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• **ABSTRACT**

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This thesis details the development of a functional demonstration bed designed to visualize the internal mechanics of a Continuous Variable Transmission (CVT), specifically its belt-drive system and 'infinite gear ratio' principle. The prototype features a custom mechanical structure that openly displays the CVT and allows for valve body manipulation, enabling a clear visual progression of gear ratio changes. An ESP32 microcontroller serves as the central control unit, managing a DC motor for simulated engine input and a servo motor for precise digital gear ratio actuation. Real-time speed data from input and output shaft sensors is used for accurate gear ratio calculation. User interaction is facilitated by a capacitive touchscreen interface, allowing for setting target RPMs and desired gear ratios. The system employs PID control for stable motor speed and accurate ratio adjustment. This project provides a robust mechatronic system effectively illustrating the operational principles of CVT Transmission for educational and demonstrative purposes.



DEDICATION

I dedicate this thesis work to whom it may benefit from this thesis topic for future Mechatronics engineer student and educational purposes.



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