Optimal clamping force control for push belt CVT

Master Thesis at Vicura

Vicura, an engineering company originated from General Motors (GM) Powertrain and Saab Automobile Powertrain AB. Started as an independent company VICURA AB on Jan 4th 2011, majority owned by Fouriertransform AB. Vicura is offering product development with focus in transmission, electric drive and control systems and has a global customer base.

Background

CVT (Continuously Variable Transmission) is a type of automatic gearbox that can vary the actual gear ratio continuously and steplessly from low-speed to high-speed range depending on the driving conditions. Most CVT's consists of two sliding pulleys connected by a belt, where each pulley consists of two conical discs. Ratios between the axes are changed by changing the distance between the cone-shaped pulleys and thus force the belt up and down.

Thesis goal

The purpose of this thesis is to come up with an optimal clamping force control algorithm for push belt CVT.

Method

The work basically consists of the following parts:

1. Investigation aimed at retrieving an optimal clamping force control algorithm for push belt CVT. The investigation is done by document search, evaluation and simulation.
2. Developing a simulation model of the CVT subsystems to be controlled. The aim is to develop a simulation environment in which control algorithms can be developed / evaluated in an efficient manner.
3. Implement the control algorithm from above investigation that is most optimal for controlling the target system. Verify the results from above investigation.

Suitable background

M.Sc. D, Y, E, Z, or equivalent. Appropriate prerequisites: Good theoretical (and preferably practical) knowledge in relevant areas such as control engineering, mechatronics, simulation and modeling. Number of students: 2

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