Machine learning approaches for predicting oil performance loss in wet brakes and clutches

Semester Thesis / Master Thesis

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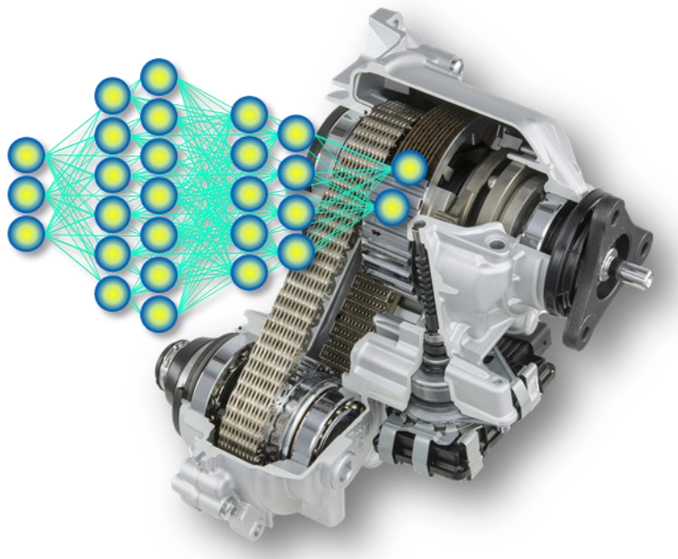
Initial situation:

Reliable friction behavior is crucial for the shifting performance and comfort of wet brakes and clutches in limited-slip differentials, active transfer cases, multi-speed transmission systems, and disconnect systems. Various experimental test series have revealed that composition and contamination through wear-related iron particles or water of modern lubricants significantly affect the friction and NVH (Noise, Vibration, Harshness) behavior as this may cause damage to the entire transmission unit. Therefore, a methodology was developed to quantify the performance loss of the lubricant by the use of defined parameters.

Objective:

Within the scope of this thesis, an existing dataset will be preprocessed to enable the application of data-driven modeling techniques. Subsequently, a predictive model will be developed using machine learning algorithms and evaluated in terms of its predictive accuracy and efficiency, in comparison with models reported in the literature.



Source: Magna 4WD ActiMax

Prerequisites:

- Interest in the field of drive technology
- Experience with ML / AI or data modeling desirable
- Ability to work independently and well-structured