AVL is the world's largest privately owned company for development, simulation and testing technology of powertrains (hybrid, combustion engines, transmission, electric drive, batteries and software) for passenger cars, trucks and large engines.

Thesis work – Optimization tool for EV-transmissions

Background
Fuel economy and NVH are important characteristics within the automotive business. In the future transmission for Electric motors will increase significantly. Therefore it’s important to know how to design these type of transmissions in order to keep the losses as low as possible, while at the same time keeping gear whine and rattle noise at a low level. Of course strength and durability requirement is a MUST to fulfill.

What
The purpose of the thesis is to create guidelines and simple tool(s) how to design the layout of an EV-transmission (1/2 speed transmission for electric motor) in order to minimize the losses while fulfilling NVH, shifting/disconnect and durability requirements.

How
- Conduct a literature survey and background investigation to understand requirements and pro’s and con’s with existing layouts of EV-transmissions, including the causes of losses, NVH, shiftability/disconnect and durability.
- Create and/or re-use existing equations/models to estimate/calculate losses, shift effort/disconnect, strength/durability and NVH.
- Define a method/process to optimize the layout/subsystems/components of the transmission in order to minimize losses and fulfilling all other requirements (Shiftability/disconnect, NVH, and Strength/Durability).
- Document methods, process and design guideline.
- Optional: Automate the method/process and create an optimization tool where variables and constrains/requirements can be inserted, and the tool propose the best layout based on this.

When
Spring 2018

Tools
Gear design tools, Excel, Matlab or equivalent.
Optional: DoE (Design of Experiments) optimization tool.

Candidates
Suitable candidates are M.Sc. students within mechanical engineering, vehicle engineering or engineering physics with a good understanding of modelling and simulations.

Contact
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