Current Role of CAE in Powertrain development process

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CAE has been used in the development of automotive powertrain from 1980's. Over last 2 decades with the increase in computation power, availability of High-performance computing and advent of new FEA tools the development of powertrain has reduced from 5 years to 2 years. A typical automatic transmission has 400+ parts. All these parts are being virtually designed, analyzed, and validated against the benchmarked target using CAE before they are ordered with the supplier.

In this talk we will look into the types of CAE analysis, some of the typical analysis requests received during powertrain development (such as Nonlinear static analysis, Modal analysis, Fastener analysis, Hyper elastic analysis for seals, Thermal analysis, Mount Boss Stiffness evaluation, Press fits – press in force, Fatigue analysis, Electromagnetic simulations for Motors), analysis sequence, and the challenges for CAE community during the analysis.

About the speaker

Mr. Ganesan Subramanian, Engineering Manager, TCS is an alumnus of IIT, Madras. He worked as Scientist B in CVRDE, DRDO from 2002 to 2005 in the development of Main Battle Tank – MBT Arjun. From 2006 till date he has been working for General Motors Company. He has held several leadership roles in Advanced Engineering, Production CAE and DRE (Design Responsible Engineers) team for the development of GM Manual and Automatic Transmission systems. He has lead team of 10 to 20 members in gear and bearing analysis, Clutch system analysis, External structure, and Sealing & fastening in Automatic Transmission. He presented her work on "Influence of Gear Web and Macro Geometry on Mesh Misalignment" at the SAE International Mobility Conference in 2016. He has a US patent on Manual Transmission Power flow, 9739345 issued in Aug 2017.