

Digital signal processing using model-based software design

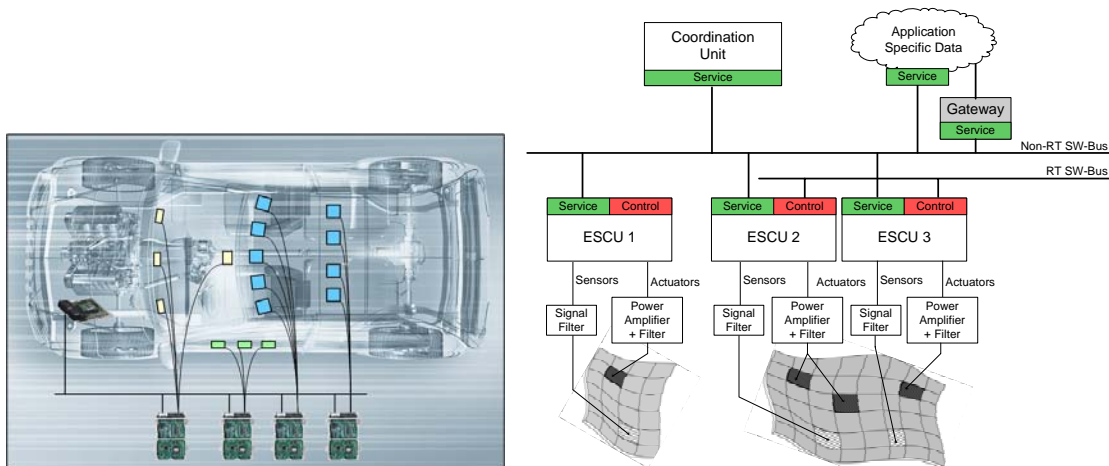
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The goal of the project Vibe-Less* is to develop a technology that allows the physical behaviour of a structure to be arbitrarily modified and reconfigured by means of embedded software technology. Embedded sensor networks measure the disturbance, e.g. vibrations. An advanced, dependable distributed control network generates the appropriate responses to cancel out the disturbance by feeding the actuator network appropriately, e.g. by generating adequate anti-vibrations.

Advanced smart structures will not only improve the durability and endurance of components due to decreased dynamic loading but also drastically reduce structure-borne noise in a broad frequency range of interest.

A DSP board (ESCU, picture below) with additional analog I/O hardware was developed to fit the requirements. As the core of the subsystem, a simple 16 Bit Digital Signal Controller with a Clock rate of 150MHz and fixed-point arithmetic was chosen. The programming of this Controller will be done using Matlab / Simulink / Realtime Workshop / Embedded Target and Texas Instrument's Code Composer Studio.

In this workshop, hardware design issues, also regarding cost aspects for the automotive sector, are discussed, as well as advantages and problems using Model Based Software design including the difficulties in the debugging of the generated software.



The Vibe-Less Partners are:

Profactor Produktionsforschungs GmbH Steyr, Austria
Magna Steyr Vehicle Development AG & Co KG, Graz, Austria
Austrian Research Centers GmbH - ARC, Vienna, Austria
ARC Leichtmetallkompetenzzentrum Ranshofen GmbH

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