# Time Triggered Decoding of MP3 Files with Giotto
# Concepts and Implementation

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Today a wide variety of different embedded systems types and embedded system architectures are in use. Many of them serve control tasks, for example in automotive of aerospace systems. In all systems exist signals that have to be processed via specific algorithms.

In this thesis we discuss the theoretical aspects and the implementation of a MP3 decoder by using processors which are widely known in the field of automotive applications (embedded systems). The main focus of this thesis lies in describing the theory behind the MP3 algorithm. The major aspects of the MP3 coding algorithm is, that the data reduction takes place in the spectral domain. So we discuss the projection techniques (transformations) from the time domain to the spectral domain and vice versa in great (mathematical) detail.

The transformation from the time to the spectral domain in the MP3 algorithm is based on filters. In order to understand the ideas behind these filters we bring up an introduction into the area of (discrete) filter theory.

During the implementing phase of the MP3 decoder, which is actually the second part of the thesis, we have focused on the concept of the time triggered architecture by using Giotto concepts. These concepts are perfectly suitable for audio data processing.