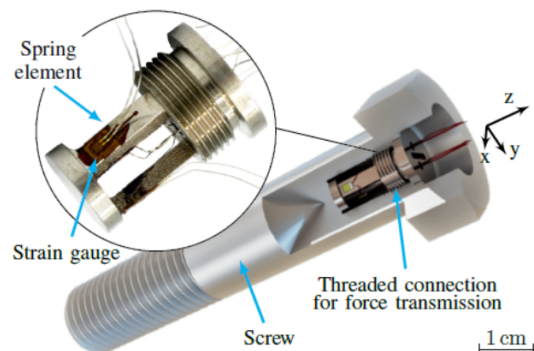


Design and Implementation of a Time Digital Converter (TDC) for a Strain Gauge

Proseminar, Bachelorthesis, Masterthesis

In future, screws will be able to measure their own tightening torque. This will make it possible to verify whether the screw has been tightened correctly, or an overload condition of the screw during operation has occurred. For this purpose, strain gauges are integrated into the screw. These form a resistive measuring bridge. The analog voltage will be converted into the digital domain by a time digital converter in a 180nm technology. In addition this circuit should use as little energy as possible.

In this work, an integrated circuit for measuring resistive bridges on basis of a time digital converter is developed. For this purpose, the circuit diagram as well as the corresponding layout must be created in Cadence Virtuoso.



Tasks:

- Research on the state of the art in the field of TDC (Time Digital Converter)
- Implementation and comparison of suitable topologies (schematic and layout in Cadence Virtuoso)
- Optimization of the selected topology

Prerequisites:

- Lecture: Analog Integrated Circuit Design
- AICD Lab beneficial

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