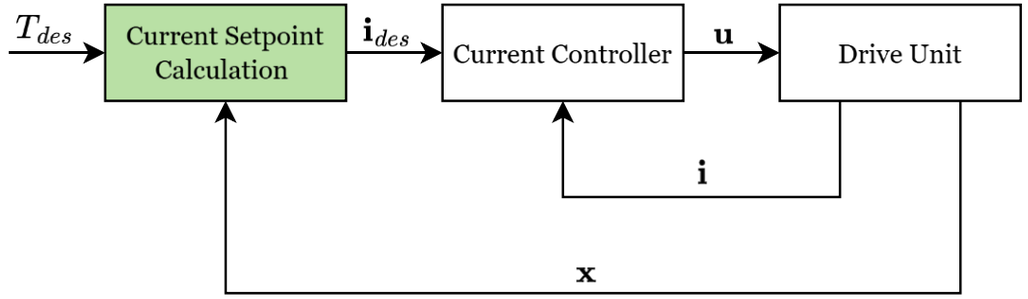
Optimal Current Setpoint Calculation for Traction Motors

- **Motivation:**

  The shift of the automotive industry towards electric vehicles and the trend towards rare earth-free electric motors has increased the relevance of wound-rotor synchronous motors (WRSM) for automotive applications. For controlling electric motors, it is generally necessary to determine current setpoints for given torque setpoints. Since current setpoints are not unique, the additional degree of freedom, especially regarding automotive applications, can be exploited to enhance efficiency. Typically, the current setpoint calculation is performed in advance. However, a current setpoint calculation during operation is preferable, since the operating conditions (voltage levels, temperatures, etc.) as well as parameter changes, e.g., due to aging, can thus be considered.

- **Objectives:**
  - Extensive literature review
  - Development of a suitable mathematical model
  - Current setpoint calculation based on optimization
  - Validation of the developed algorithm via simulation



- **Start:** now

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