

# Development of a safety-critical CAN Protocol for a medical application

## Motivation

In nowadays intensive medical care ARDS (acute respiratory distress syndrome) became one of the most problematic disease patterns. Mortality rate for ARDS is still between 40 and 60 percent.

A newer treatment option for this illness is the extracorporeal oxygenation. Here the patient is connected to an oxygenator. This device realizes a high percentage of the needed gas exchange with the blood outside the human body. The lung is disencumbered during this procedure in order to have a chance to regenerate faster.

The overall aim of the project SmartECLA is to optimize the used devices for the extracorporeal oxygenation according to the medical requirements and to develop a safety driven closed-loop control for this system. SmartECLA is part of a research network of 6 chairs out of 4 different faculties founded by the DFG.

## Task

The concept of system planes several autonomous devices that shall communicate with each other via CAN-Bus. It is the task of the described thesis to work out a fault tolerant CAN Protocol definition with respect to the special needs of the project. Therefore also existing CAN-Protocols should be looked at and based on these protocols a specification shall be developed.

## Outline

- Familiarize with the topic
- Point out the requirements towards the communication-protocol
- Comparison with existing CAN-Protocols
- Detailed specification of the developed CAN-Protocol
- Exemplary implementation
- Documentation of the results

## Goal

The aim of the thesis is to create a detailed definition for the CAN-Protocol that shall be used in the project SmartECLA.

## Fields of Study

- Computer science, electrical engineering or comparable

## Student

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## Tutor

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