



Simple C++ SocketCAN Library

Tobias Triffterer

Ruhr-Universität Bochum – Institut für Experimentalphysik I

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- SocketCAN: API of the Linux Kernel to treat CAN bus as a network protocol
 - As all Linux Kernel APIs based on C, not C++
- ⇒ Create reusable library to use SocketCAN comfortably in C++

Class CanBusConnection

- Frontend for the library user
- Move-constructible through “pimpl pattern”
- Sending a CAN frame:
`void sendCanFrame(const CanFrame& canframe)`
- Setting filters for receiving CAN frames
- Filters evaluated by the Kernel
- Reception via Callback, no read method

⇒ `std::function<void(const CanFrame&)>` Callback

Class CanFrame

- Encapsulates a single CAN frame the C++ way
- Convertible to and from `struct can_frame` of the Kernel
- Construction Example (DLC determined automatically):

```
const CanFrame request
{
    _address,
    CanFrame::CanFrameData
    {
        OpCodes::ReadWiperPositionAllChannels,
        boardid
    }
};
```

- Errors handled via C++ Exceptions
- BadCanFrameMetadata
 - ▶ Address out of range
 - ▶ Too many bytes in CanFrameData
- SystemCallException
 - ▶ Any call to the kernel fails
 - ▶ Wrapper for C's `errno`
 - ▶ Provides name of failed system call, error code and error message for said error code

Outlook

- Library used by several projects of my own

⇒ It works!

- In the future extension to CAN-FD
- Interface can be simplified using C++20 and variadic templates

- Code available at EP1 Gitlab:
`https://gitlab.ep1.rub.de/dcs/CanBusToolbox/`
- If no account, ask me.