



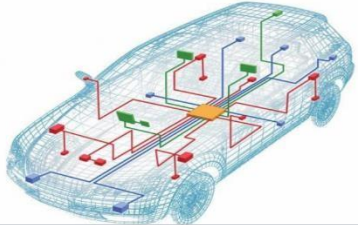
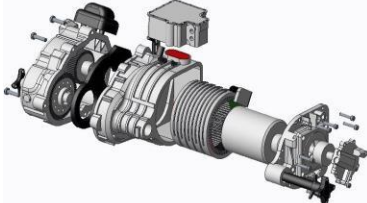
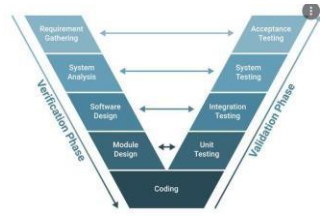
Create, Embed, Empower

Competency Highlights

Family of ST microcontrollers

About Crevavi

An Indian product company, founded in 2011

Automotive	EV experience	SW Functional Safety
		
Automotive ECU software	Inverter, OBC, DCDC, BMS	ISO26262 compliance knowhow

Global footprint



Company strengths

- 250+ Man years of Automotive ECU experience
- Expertise in setting up Automotive R&D teams for global clients
- Specialized in EV ECUs
- Research centre for Automotive electronics

- ECU Systems
 - From Concept to Series production
 - HV EV ECU – Inverter , DCDC, Onboard Charger, BMS
 - Body, Chassis, Cockpit and Engine Management systems
 - Product design house and ODM services
- SW Defined Vehicle(SDV)

Leadership Team & Bangalore office premises



Ravikishore Attili

- Co-founder, CMO
- 22 yrs. of exp: Wipro, IBM
- SME: IoT, Cloud, Java



Sachin Shivapur

- Co-founder, CEO
- 23 yrs. of exp: Wipro, Siemens, Bosch, Intel
- SME: Automotive, IoT



Shriram Kathavate

- Co-founder: CTO
- 20 yrs. Of exp: Siemens
- SME : Automotive



Sujata Sahu

- COO: Operations Head
- 22 yrs. of exp: Printronix
- SME: Program management

Number of developers

60+

Test benches

3+

Lab facilities

3+

Locations

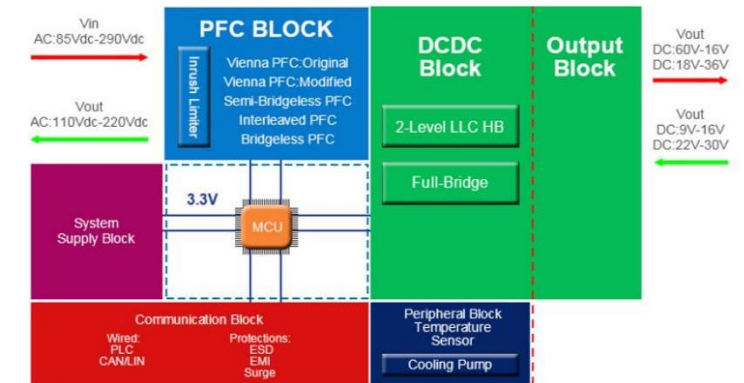
5+

- ODM capabilities for bespoke product development
- Contract manufacturing compliant to demanding standards
- BSP development for microcontroller platforms
- Low-level device drivers, complex drivers, AUTOSAR BSW development and integration



E-Mobility: SW development for HV On-board Charger ECU

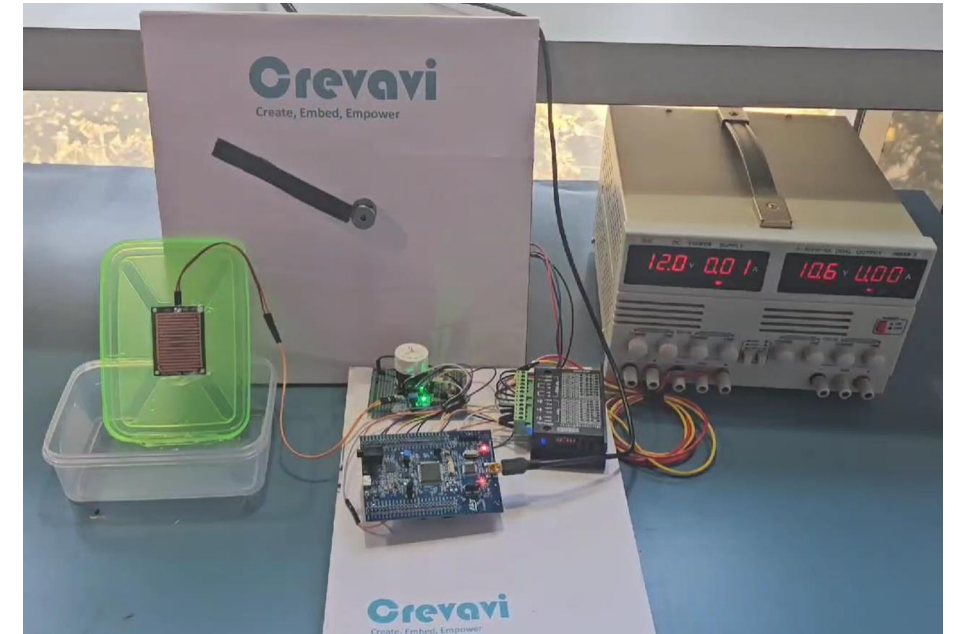
- **Project content:** CPU load reduction for AUTOSAR BSW stack on Multicore, Mixed ASIL ECU
- **Details:**
 - Entire Configuration analysis of AUTOSAR BSW and MCAL stack
 - Analysis of high frequency function calls and stacks
 - Profiling of start up, shutdown, communication (CAN-FD, LIN and Ethernet), OS Applications, spinlocks, memory and watchdog stacks
 - Validate and measurement of CPU loads reduction and memory optimization
 - Verify NVM(D-Flash), wakeup, Ethernet, SOMEIP configuration for SOP
 - Write and validate microcontroller functional safety drivers to be compliant with ISO26262
 - Achieve ASIL-D safety concept
 - FCCU configuration, CRC, Memory error management and reporting of events
 - Validate multi-core, mixed-ASIL functionality
 - Memory and core partitioning
- **ECU HW**
 - **ST SPC58 Chorus** family
 - e200z4 triple core:32-bit Power Architecture technology CPU



Automatic Rain sensing wiper ECU: Demonstrator

Content

- The timer module and ADC module are configured to control the motor based on input from an IR sensor.
- A state machine for switching between manual and automatic control modes
- Closed loop control algorithm to process ADC inputs and drive motor
- in automatic mode, the motor speed is adjusted based on the analog input from rain sensor
- In manual mode the user can select the motor speed using switches
- System Details
 - Hardware:
 - STM32F4 DISCOVERY Kit
 - 32-bit Arm Cortex-M4 with FPU core
 - 16Mhz / 1-Mbyte Flash / 192-Kbyte
 - Stepper Motor: 3.3 V, DC 1 amps,
 - Rain detecting IR sensor
 - Rotary switch and glass module to represent windshield.
 - Software:
 - Application and Device drivers in C Language
 - Platform: STM32CubeIDE



Link to demonstrator video:

<https://mobility.crevavi.com/automatic-rain-sensing-windshield-wiper/>

Robotic Arm: Demonstrator Project

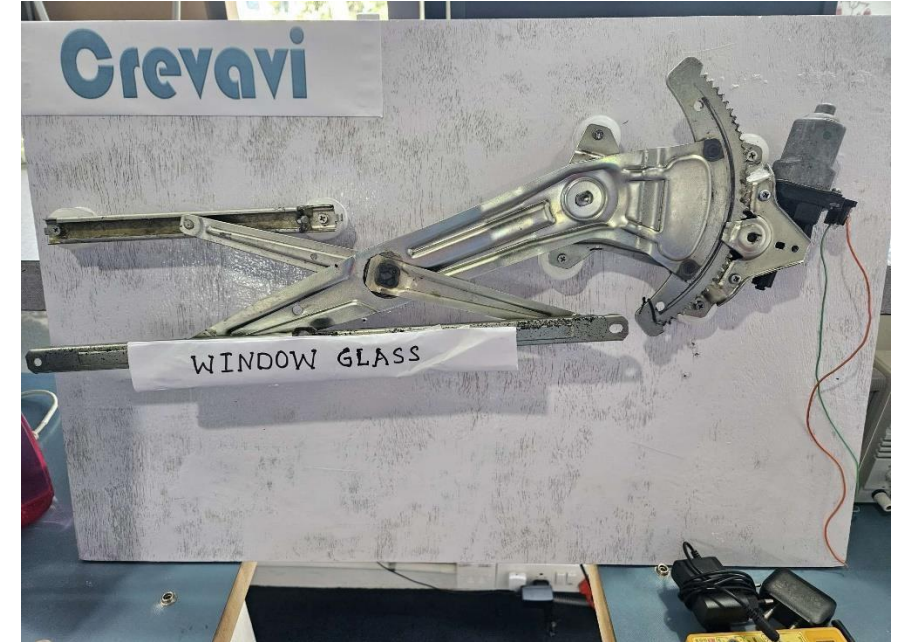
- **Content:**
 - Lift and drop a payload of 4 kg object at a distance of 1.5 meters
 - Drive Maxon motor
 - renowned for its exceptional torque-to-weight ratio, particularly suitable for space applications.
 - Drive a H-bridge with PWM
 - Perform precise duty cycle calculations to regulate motor speed and torque
 - ensuring accurate lifting and dropping movements using STM32 MCU.
 - Use Ultrasonic sensor integrated to accurately measure distances, providing crucial feedback for positioning tasks.
 - Display lift and drop distance parameters in an LCD
- **System Details**
 - Hardware:
 - STM32F4 DISCOVERY Kit
 - 32-bit Arm Cortex-M4 with FPU core
 - 16Mhz / 1-Mbyte Flash / 192-Kbyte
 - Software:
 - Application and Device drivers in C Language
 - Platform: STM32CubeIDE



Anti-Pinch : Demonstrator ECU project

Content:

- **Develop anti-pinch ECU demonstrator project**
 - Detect spike current in window motor
 - Configure ADC to read current sensor input
 - Drive window motor based on the threshold values during obstacle detection
 - Drive full window motor for normal operations.
- **System Requirement**
- **Hardware:**
 - STM32F4 DISCOVERY Kit
 - 32-bit Arm Cortex-M4 with FPU core
 - 16Mhz/1-Mbyte Flash memory/192-Kbyte RAM
 - ACS712 Current sensor
 - Supply Voltage: 4.5V ~ 5.5V DC,
 - Measure Current Range: -5A ~ 5A
- **Software**
 - Application and Device drivers in C Language



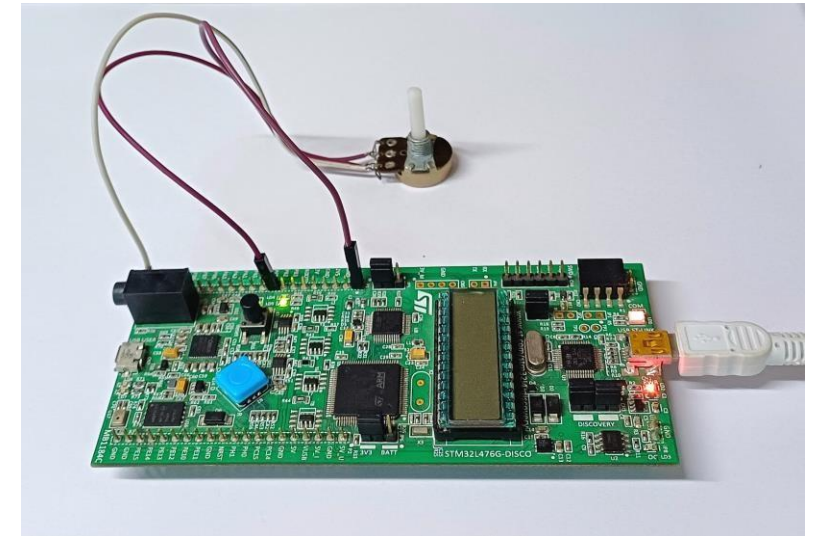
Project Demo:

<https://mobility.crevavi.com/anti-pinch-mechanism-for-power-windows/>

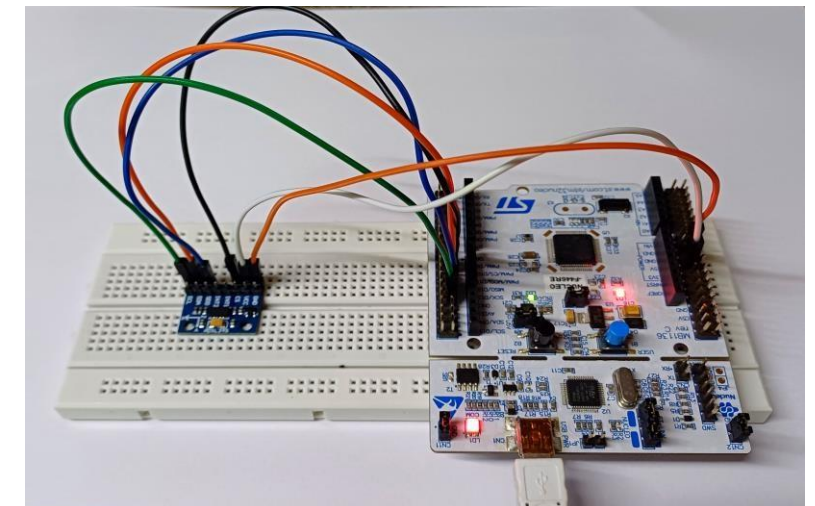
Platform driver development : ADC, PWM, SPI and UART drivers

Content:

- **Bare metal programing**
- **ADC driver**
 - Convert analog input voltage/current to digital Configuring ADC registers to set sampling rate, resolution, reference voltage, etc.
- **PWM driver**
 - Generate PWM signal
 - 1Khz frequency with 50% duty cycle
 - Base clock, timer and prescalar configuration
- **UART driver**
 - Communicate with PC using UART
 - Configure UART peripheral - baud rate, frame bits, stop bits, and parity
 - Polling and interrupt mode
- **SPI Driver**
 - Configure SPI driver to communicate with accelerometer sensor
 - Clock polarity, clock phase, and baud rate
 - full-duplex communication with the accelerometer sensor
 - Receive accelerometer data for each axis
 - Perform calibration to get physical values (e.g., m/s^2 or g)



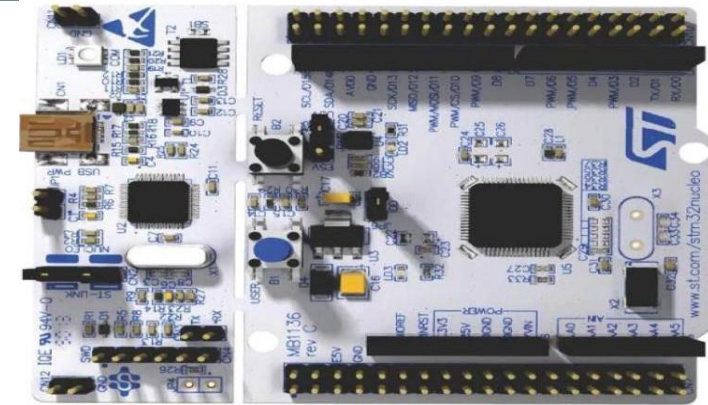
STM32L476 Discovery Board



CAN Driver development

Content:

- Bare metal **CAN driver** development
 - Validate CAN protocol with CAN bus analyzer
 - Configure CAN peripheral
 - baud rate, message format (standard or extended), message filters
 - CAN message format
 - identifier, data length, data payload
- Configure the CAN bus analyzer software
 - to capture and analyze the received CAN messages,
 - Displaying message identifiers, data payload, and timestamps.
- **Hardware:**
 - STM32F4 DISCOVERY Kit
 - 32-bit Arm Cortex-M4 with FPU core
- **Software**
 - Application and Device drivers in C Language



CAN BUS Analyzer

File View Tools Setup Help

Rolling Trace

TRACE	ID	DLC	DATA 0	DATA 1	DATA 2	DATA 3	DATA 4	DATA 5	DATA 6	DATA 7	TIME STAMP (sec)	TIME DELTA (sec)
RX	0x11	7	0x43	0x52	0x45	0x56	0x41	0x56	0x49		1529.9349	0.001
RX	0x11	7	0x43	0x52	0x45	0x56	0x41	0x56	0x49		1529.9340	0.000
RX	0x11	7	0x43	0x52	0x45	0x56	0x41	0x56	0x49		1529.9339	0.011
RX	0x11	7	0x43	0x52	0x45	0x56	0x41	0x56	0x49		1529.9229	0.001
RX	0x11	7	0x43	0x52	0x45	0x56	0x41	0x56	0x49		1529.9220	0.000
RX	0x11	7	0x43	0x52	0x45	0x56	0x41	0x56	0x49		1529.9220	0.000
RX	0x11	7	0x43	0x52	0x45	0x56	0x41	0x56	0x49		1529.9219	0.000
RX	0x11	7	0x43	0x52	0x45	0x56	0x41	0x56	0x49		1529.9219	4294.967
RX	0x11	7	0x43	0x52	0x45	0x56	0x41	0x56	0x49		1529.9220	0.001
RX	0x11	7	0x43	0x52	0x45	0x56	0x41	0x56	0x49		1529.9210	0.000
RX	0x11	7	0x43	0x52	0x45	0x56	0x41	0x56	0x49		1529.9209	0.000
RX	0x11	7	0x43	0x52	0x45	0x56	0x41	0x56	0x49		1529.9209	0.000
RX	0x11	7	0x43	0x52	0x45	0x56	0x41	0x56	0x49		1529.9209	0.001
RX	0x11	7	0x43	0x52	0x45	0x56	0x41	0x56	0x49		1529.9200	0.000

Thank You for your time!!

Sachin Shivapur

Co-Founder & CEO

sachin.shivapur@crevavi.com

Contact, India: +91 821 2518805



Shriram Kathavate

Co-founder & CTO

shriram.kathavate@crevavi.com



<https://mobility.crevavi.com>

<https://www.crevavi.com>