# Working Student Program 2024

Software/Tool development

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# Software & Tool Development
## ProgressWire

### 1. Project Description

The ProgressWire app is a web-based solution designed to collect innovative improvement ideas from employees, check similar ideas and manage all the necessary steps for approval, implementation and tracking the bonus receival. The ideas submitted can cover a wide range of areas, having the purpose of constantly improving the quality of services, products and work environment, while reducing the cost and time.

ETC stands for Engineering Tools and Cloud. Together with our partners from Germany and Austria, we are developing Web Based Software Tools, providing UI/UX solutions, enabling digitalization in engineering for software development.

### ❑ Basic know-how

- OOP principles
- Data structures & algorithms
- Relational databases
- Web development (HTTP, Frontend technologies)
- Basic architectural patterns

### ❑ Programming languages

C# .NET Angular TS Microsoft SQL Server

### 2. Learning Opportunities

Working with the latest technologies, you can apply what you studied in university in a young and Agile environment. We encourage self development, while we providing up-to-date trainings and close mentoring.





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# Software/Tool Development
## C++ Tools Software Development for Computer Vision

### 1. Project Description

State-of-the-art frameworks and applications for facilitating Computer Vision algorithm development for Autonomous Driving


### ❑ Basic know-how

- Strong OOP knowledge
- Algorithms and Data Structures
- Design Patterns
- Multithreading

### ❑ Technologies

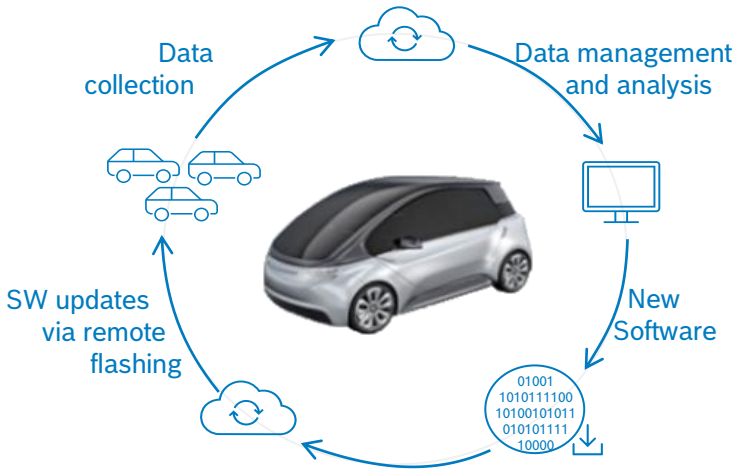
.NET unity OpenCV ROS AOS boost

### ❑ Programming languages

C++ C# python™

### 2. Learning Opportunities

- Hands-on experience with various technologies
- Get to work with experts in a strong Agile team





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# Engineering SW Projects

## Project Software System Design in Combustion Engine Control unit

### 1. Project Description

- Analyses of future development and analyses of reported problems for SW (in interaction with HW), Calibration, Integration in projects from acquisition and start of development until **start of production**.
- Diesel **ECU**s, V4 and V6, EU6 and EU7 projects.
- Customers: VW and Audi
- Products (eq): VW Passat 2.0 TDI V4 ECU, Audi Q7 3.0 TDI V6 ECU

### ❑ Basic know-how

- Essential project management, problem solving and development methodologies (V-Cycle, Agile).
- Basic electronics

### ❑ Programming languages and tools

- C, python, java
- Work with industry-standard Measurement-, Development- and Configuration tools

### 2. Learning Opportunities

- Real-world application of project development and analyses practice.
- Exposure to industry-specific software and tools.
- Understanding of complex embedded systems.





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# Software KPI Reporting

## 1. Project Description

Q-KPI Software tool extracts tickets from a project's Jira page and stores valuable data that is used for fast calculation and visualization of different KPI's

## ❑ Basic know-how

OOP Principles, HTTP Protocol, API Usage, Relational Databases

## ❑ Programming Languages


## 2. Learning Opportunities

Calculate KPI's based on data from a project's management tool (Jira, Docupedia, eg.)
Can lead to better management of projects.
Makes data easier to visualize.





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# CareerPath

## 1. Project Description

CareerPath is your trusted companion for taking your career to the next level or making a successful career change. CareerPath offers a clear and personalized roadmap to help you achieve your professional goals. Discover the precise steps, skills, and insights you need to reach your desired destination.

Beside this application, in our group we are responsible for a wide range of services covering the entire SDLC (requirements, UI/UX, development, testing and deployment) for web applications.

## ❑ Basic know-how

- OOP principles
- Data structures & algorithms
- Relational databases
- Web development (HTTP, Frontend technologies)
- Basic architectural patterns

## ❑ Programming languages

Java, spring, Angular, HTML, CSS, JS, Microsoft SQL Server, Maven

## 2. Learning Opportunities

Master essential skills, including Java, HTML, CSS, TypeScript, and more. Gain hands-on experience through real-world projects, guided by mentors. Elevate your coding proficiency and build a strong foundation for a successful career in web development.






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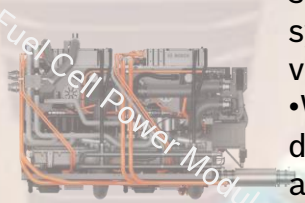
# Software Tool Development
## Virtualization for Software-in-the-Loop Virtual Vehicle

### Project Description

- Virtualization of the ECU in order to simulate the behavior of the real microcontroller on a personal computer.
- Use of the virtual ECU inside Software-in-the-Loop (SiL) closed loop setups.
- CI/CT - Continuous Integration and Continuous Testing using Bosch internal tools. Our main focus is infrastructure development of CI/CT.




### Info about the group

•Our group is responsible for Software-in-the-Loop (SiL) solutions designed for simulating and testing powertrain systems from Fuel Cell and Electric vehicles.
•We have responsibility for function development and software qualification activities from all the subsystems (Air, H2, Electrical, Thermal, Stack) of the Fuel Cell system.

### Basic know-how

- Identify by debugging toolchain problems
- V-cycle basic overview (one Google search ☺)
- Scripting and algorithm implementation

### Software Technologies

Jenkins
ETAS
ECU-TEST

QTronic VIRTUAL ECUs

### Programming languages

MATLAB
Code generator
C generated code
python



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# Software/Tool Development

## Cloud Services - Full Stack Web Application

### 1 Project Description

We offer practical work experience and an introduction to creating and improving web-based systems in a cloud environment. During the internship you will get knowledge on both back-end and front-end, by creating the architecture, implementing features, building APIs, creating UI and many other fun activities.

### 2 Info about the group

We are a diverse group of engineers and software developers, working on a wide range of non-automotive topics, including computer vision, cloud solutions, and autonomous solutions for rail vehicles.

### 3 Basic know-how

Logical thinking, OOP
HTTP requests
HTML, CSS
Git

### 4 Technologies

NestJS
JavaScript Frameworks (VueJS, ReactJS, etc.)
Databases (MongoDB, etc.)

### 5 Programming languages

JavaScript, TypeScript






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# Software & Tool Development
## Continuous Integration in the Automotive context

### 1. Project Description

As the Automotive industry is continuously growing, our team is focusing more and more on designing and implementing new solutions to **enhance the software delivery process**. Our goal is to facilitate this delivery process by applying modern concepts such as **continuous integration, testing and delivery** in the process of Software Development for Steering Systems.

### ❑ Basic know-how

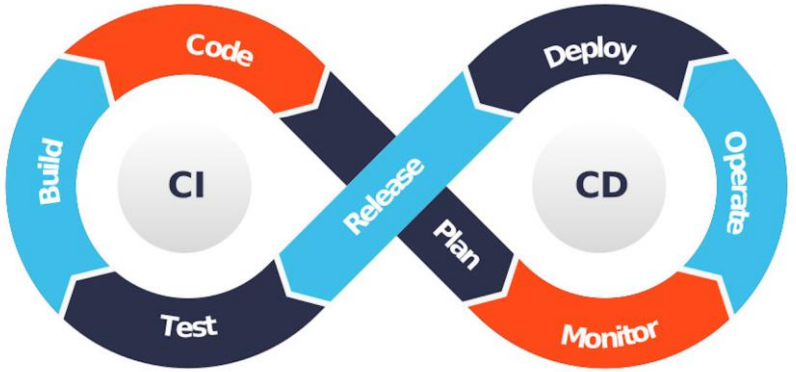
- OOP
- Git
- Batch\Powershell
- Design Patterns
- UnitTesting (good to know)

### ❑ Programming languages

Java, BASH, python, CMake

### 2. Learning Opportunities

Learn CI/CD, Python, Git. Enhance skills in version control, scripting, and DevOps practices.





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# Software & Tool Development

## Cloud-based charging services in e-Mobility domain

### 1. Project description

We offer practical work experience and an introduction to creating and improving a web-based system in a cloud environment in the e-mobility domain with focus on charging services for electric vehicles. During the internship you will get knowledge on both back-end and front-end, by creating the architecture, implementing features, building APIs, creating UI and many other impactful activities.

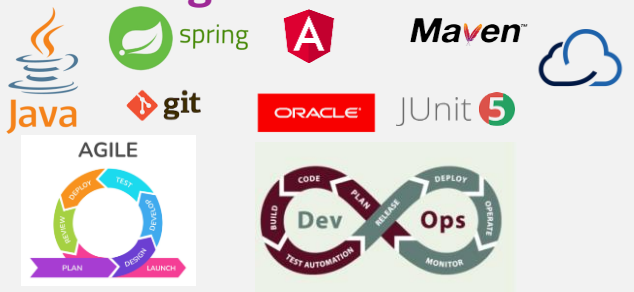
### 2. Info about the group

Our group delivers **cloud software solutions** within e-mobility domain, having with focus on end-to-end charging services for electric vehicles, such as charging point management and public charging. We build fast, responsive and scalable solutions, based on microservice architectures, following the agile methodology and a DevOps approach.

### ❑ Basic know-how

- Good know-how in Java & Spring
- Database management: relational database using SQL and Oracle
- Algorithms and data structures
- Basic HTTP knowledge
- Basic Unit Testing know-how
- Good English skills in written & verbal

### ❑ Programming languages & technologies





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