

Silicon Mobility

Apprenticeship Description

Advanced Emotor-Inverter Control Algorithms Development & Verification (*SM-STA004 / 2022*)

Description

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| Company | <p>SILICON MOBILITY SAS (numbered 815 085 659 000 28 RCS Grasse)</p> <p><u>Head office</u> : Les Aqueducs – Bât 2 – 535, route des Lucioles – 06560 Valbonne Sophia-Antipolis</p> <p>The Automotive industry is living a revolution. Electrification, autonomous driving, diverse mobility, connectivity are trends that are drastically changing the industry's rules. Among all decisive topics revolutionizing cars in the next future, Silicon Mobility is committed to supporting the rapid advent of electric and hybrid cars.</p> <p>Silicon Mobility is a technology leader for cleaner, safer and smarter mobility. The company designs, develops and sells flexible, real-time, safe and open semiconductor solutions for the automotive industry used to increase energy efficiency and reduce pollutant emissions while keeping passengers safe.</p> <p>We are looking for a good candidate to join our R&D team working in Sophia-Antipolis on the French Riviera.</p> <p>Please contact us: internship2022@silicon-mobility.com</p> |
| Offer Number | SM-STA004-2022 |
| Project Title | New E-motor Control algorithms: Development & Verification |
| Period | 12 months from September 2022 to September 2023 |
| Working hours | 35 hours a week at Silicon Mobility office |
| Income | From 1300€/month + Tickets Restaurant |
| Student level | Last year of Masters (BAC+5 or equivalent) |
| Project Description | <p>The candidate will integrate the R&D system team.</p> <p>The Silicon Mobility solution is based on OLEA® FPCU (Field Programmable Control Unit) that embeds a CPU core, programmable logic, memories, and peripherals.</p> <p>The candidate's responsibility consists of analyzing, defining, developing, and testing algorithms that will be executed on OLEA® FPCU.</p> <p>This project will be divided into 3 main phases:</p> <p><u>Ramp-up:</u></p> <ul style="list-style-type: none"> • Learning phase on the e-motor and inverter control algorithms • Understand and apply the ASPICE Flow put in place • Participate in some optimization of the e-motor and inverter control algorithms <p><u>Development & Integration:</u></p> <ul style="list-style-type: none"> • Design of advanced e-motor and inverter control features on Matlab/Simulink using silicon mobility's Target Framework • Project integration depending on supported variants <p><u>Tests specification and Verification:</u></p> <ul style="list-style-type: none"> • Specify and perform the unitary, integration and functional tests on MIL (Model In the Loop) using Simulink Test • Participate in qualification tests on HIL (Hardware In the Loop) • Participate in test automatization <p>Several tasks will be led:</p> <ol style="list-style-type: none"> 1. <u>Learning phase and research</u> In this task, the candidate will get familiar with our OLEA® APP - T222 INVERTER and our development tools including OLEA® COMPOSER environment and our AGILE and ASPICE development flow. He will start to perform research on the domain of new e-motor and inverter algorithms and will start to prototype and evaluate some solutions under Matlab/Simulink. 2. <u>Specification and implementation</u> During this task, the candidate helped by our system team will select the best solution |

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| | <p>to be implemented. The solution will be fully specified and implemented using our OLEA® COMPOSER tool chain.</p> <p>Due to the safety-related features, this development will follow ISO 26262 development guidelines.</p> <p>3. <u>Verification and Documentation</u></p> <p>During this task, the candidate will have to verify and characterize the efficiency of the developed algorithms in the different configurations using our dSPACE Hardware In the Loop (HIL) environment. Documentation will be then written to guide the user on the configuration and usage of the features developed.</p> |
| <p>Profile</p> | <p>We are looking for a candidate with good knowledge of hardware power electronics, electric motor control algorithms, embedded systems, and embedded C programming.</p> <p>He must have also good skills in electrotechnics, Inverter topologies, Matlab Simulink.</p> <p>HIL Bench experience is a plus.</p> <p>The candidate must be autonomous and rigorous with a strong team spirit.</p> <p>English speaking is required.</p> |
| <p>Skills developed</p> | <ul style="list-style-type: none"> • Matlab/Simulink • Power electronics transistors • Safety • Emotor and inverter control algorithms • Critical real-time embedded software on ARM processor • General knowledge in microcontrollers' development • Requirement analysis and specification writing • Quality management skills |