STMicroelectronics Tunis

PFE Book 2026

We are creators and makers of technology

One of the world's largest semiconductor companies

50,000 employees
of which **9,000+** in R&D

$13.3 billion revenues
in 2024

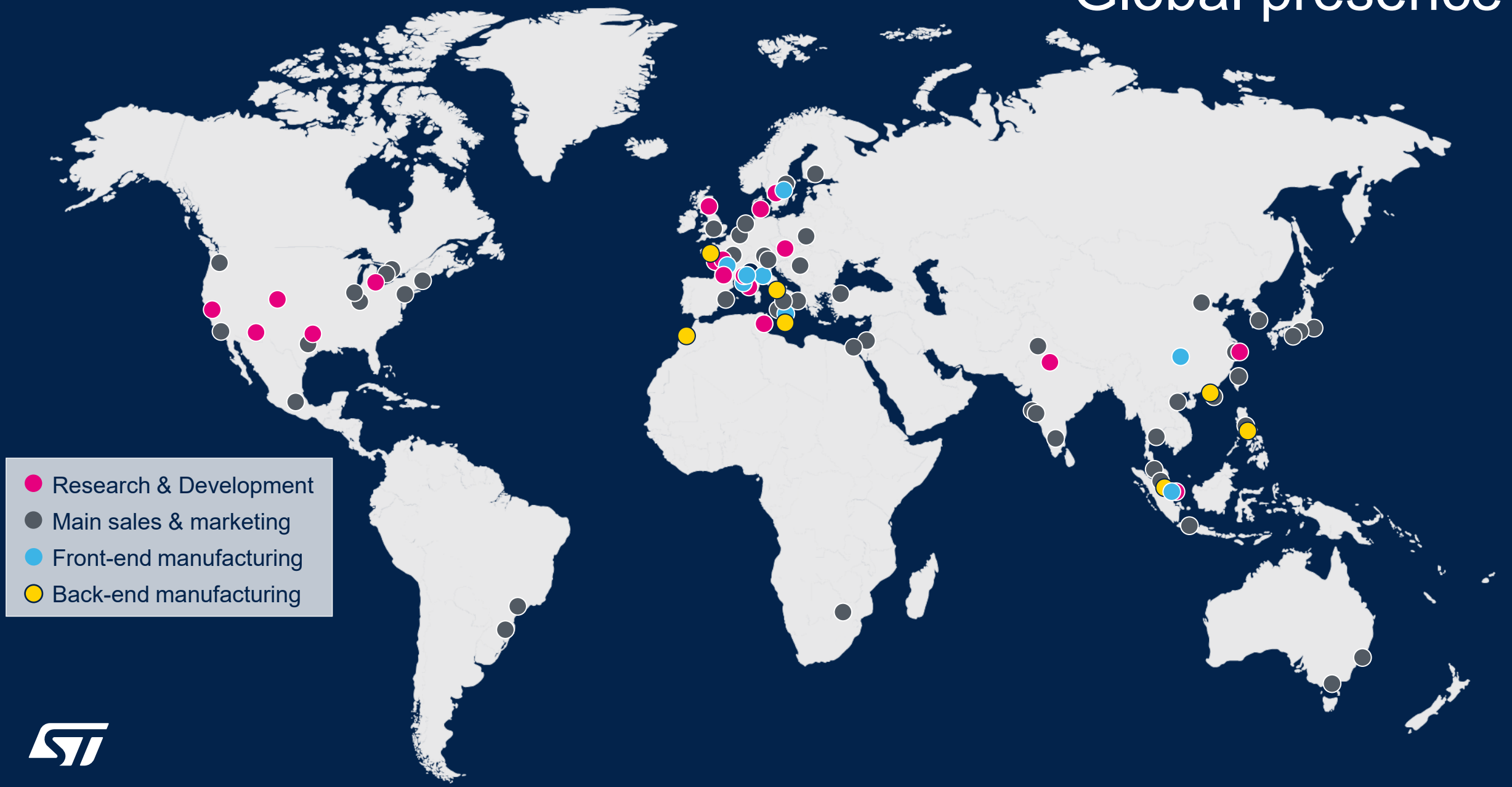
Over **80** sales & marketing offices serving over **200,000** customers across the globe

14 main manufacturing sites

Signatory of the United Nations Global Compact (UNGC)
Member of the Responsible Business Alliance (RBA)

As of December 31, 2024

Global presence



Our vision

ST stands for

life.augmented

Everywhere microelectronics
makes a positive contribution to people's lives,
ST is there.

Our value proposition for all our stakeholders

For our **shareholders**

Return value in line with our objective

Sustainable and profitable growth

For our **customers**

Provide differentiating enablers

Independent, reliable & secure supply chain

For all our **stakeholders**

Committed to sustainability

Our values: Integrity – People – Excellence

Our technology starts with you

At ST, we create
technology that starts with

You

- Our employees
- Our customers
- Our partners

Where you find us

Making **driving** safer, greener, and more connected

Enabling the evolution of **industry** towards smarter, safer, and more efficient factories & workplaces

Making **homes & cities** smarter, for better living, higher security, and to get more from available resources

Making everyday **things** smarter, connected, and more aware of their surroundings

2026 – PFE Graduation Project Subjects

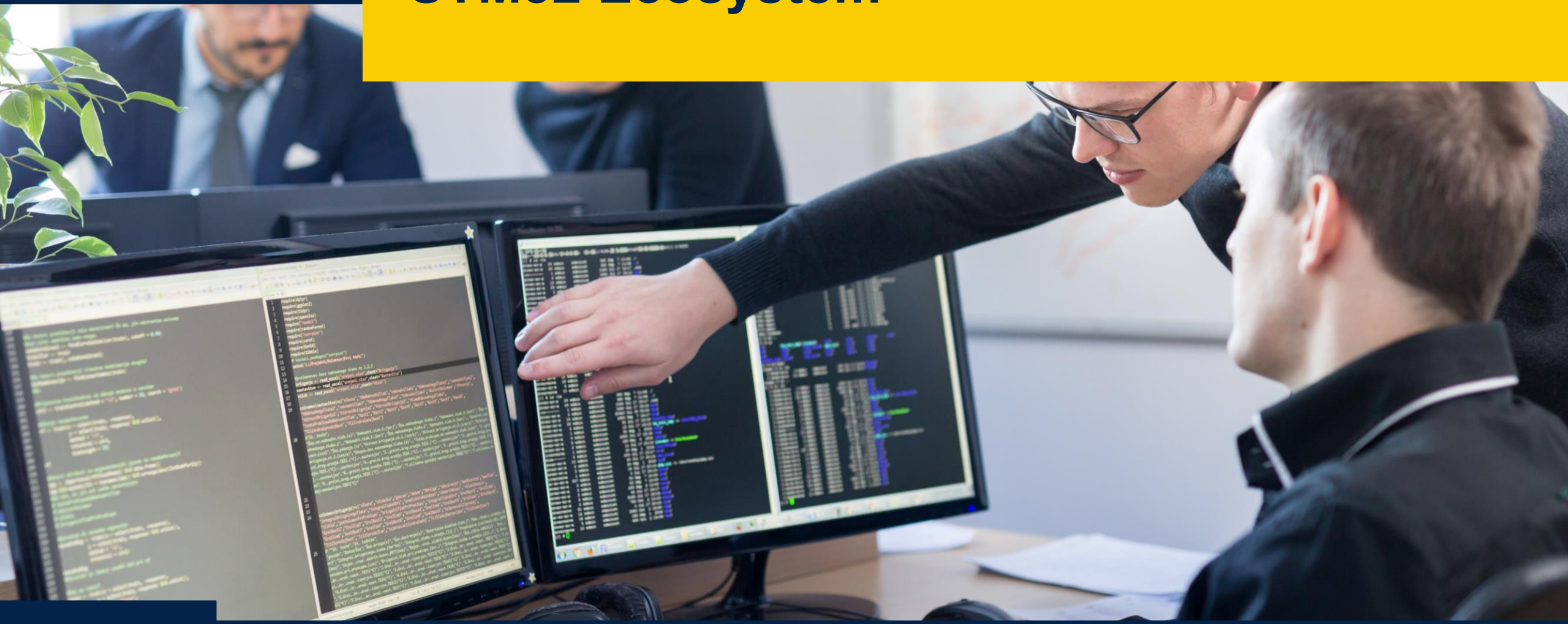
6 months

From February to August 2026

List of Projects by Department

DEPARTMENT	NUMBERS OF PROJECTS
STM32 Ecosystem	09
STM32 Ecosystem Support	02
Laboratory Characterization	01
Tools Department	04
Hardware Department	02
Application & Product Support	01
Sales & Marketing	01

STM32 Ecosystem



Project_ID01 : FPGA Non-Regression Workflow Automation

Link to Apply: **8548**

Work To Be Done

- Analyze and design an automated non-regression testing workflow on the FPGA platform.
- Implement CI/CD jobs to trigger builds and tests based on project updates.
- Automate setup of the FPGA platform environment, functional tests execution and results reporting with HTML summaries.

Number Of Trainees Needed

01

Purpose

This internship aims to develop an automated framework to streamline the non-regression testing process for FPGA validation of STM32 MCUs.

The solution will enable automatic updates, builds, and functional test executions triggered by relevant project changes, ensuring continuous validation of SW and FPGA netlist releases.

Keywords

C, Python, Git, Bash, IAR, JSON, CI/CD, Jenkins

Project_ID02 : STM32 Bootloader Tests Automation FW Enhancement

Link to Apply : **8549**

Work To Be Done

- Define and validate projects templates (automated test environment) for each product category.
- Design and Implementation of a Continuous Testing Pipeline using Jenkins for BL Automated Testing Platform.
- Enhance the bootloader test FW by integrating new features (OBK provisioning, SWD communication with embedded I3C host, auto fill of VTR document with tests results…).

Purpose

This internship project aims to enhance the bootloader tests automation FW by integrating new features like continuous testing pipeline and enhancing existing ones.

Number Of Trainees Needed

01

Keywords

Embedded C, IAR, STM32, Bootloader, Python, C++, QT, XML, Automation, Excel, Jenkins, Git.

Project_ID03 : AI-powered Chatbot for Customer Support Using STMicroelectronics' Public GitHub Data

Link to Apply : **8520**

Work To Be Done

- ❑ Collect and preprocess public data from STMicroelectronics' GitHub repositories.
- ❑ Define and format the data to be compatible with AI training requirements.
- ❑ Develop and train a generative AI (GenAI) model capable of understanding and responding to customer queries.
- ❑ Implement Retrieval-Augmented Generation (RAG) to improve response accuracy by combining retrieval of relevant documents with generative capabilities.
- ❑ Test and refine the chatbot to ensure reliability and relevance in customer support scenarios.

Number Of Trainees Needed

01

Purpose

The project aims to develop an AI chatbot for customer support by utilizing public data from STMicroelectronics' GitHub.

This solution will enhance user experience by automating responses to technical queries and improving the time to answer.

Keywords

AI chatbot, Generative AI, Data preprocessing, Model training, Retrieval-Augmented Generation (RAG), GitHub data, Customer support automation

Project_ID04 : STM32Cube ecosystem Benchmark

Link to Apply : **8532**

Work To Be Done

- Develop similar scenarios on ST and peer MCU platforms using their embedded software frameworks.
- Evaluate code quality metrics such as coverage, simplicity, integration, consistency and portability.
- Conduct functional testing to assess performance, memory footprint and robustness of the scenarios across different platforms.
- Compile a comprehensive benchmark report summarizing the results, insights, and recommendations for ST framework improvements.

Number Of Trainees Needed

01

Purpose

This internship project aims to develop and validate comparable embedded application scenarios across different MCU software frameworks for benchmarking purposes.

The project will enable static and functional analysis to highlight strengths and improvement opportunities, supporting strategic decisions for ST embedded software ecosystem enhancement.

Keywords

Embedded C, Static Analysis, MCU performance ,Software Frameworks, Code Quality, Benchmarking

Project_ID05 : AI-Powered Chatbot and Virtual Assistant for DevOps

Link to Apply : **8543**

Work To Be Done

- Define Analyze the current DevOps workflows and identify repetitive requests suitable for automation via chatbots or virtual assistants.
- Design and develop Build an intelligent chatbot or virtual assistant integrated with DevOps tools (e.g., Jenkins, GitHub Action) to assist in build incident management, Automatic diagnosis, Automated actions and answer frequently asked questions.
- Enhance Implement natural language processing (NLP) capabilities to improve user interaction and extend functionalities based on user feedback and evolving DevOps practices.

Purpose

This internship project aims to streamline and automate routine DevOps operations by leveraging conversational AI, reducing manual effort, accelerating response times, and improving overall operational efficiency.

Keywords

DevOps, AI, NLP, CI/CD, Jenkins, Git, Python

Number Of Trainees Needed

01

Project_ID06 : AI-Driven Predictive Test Selection

Link to Apply : **8544**

Work To Be Done

- Define Analyze existing test suites and historical test execution data to identify patterns for predictive modeling.
- Design and develop Create machine learning algorithms to predict the most relevant subset of tests to run based on recent code changes, historical failures, and risk factors.
- Enhance Measure prediction accuracy, test coverage, and reduction in testing time to validate effectiveness.

Number Of Trainees Needed

01

Purpose

This internship project aims to optimize EmbSW testing processes by intelligently selecting tests most likely to detect defects, thereby reducing testing time and resource consumption while maintaining high software quality.

Keywords

DevOps, AI, NLP, CI/CD, Jenkins, Git, Python, Robot FrameWork

Project_ID07 : Secure Data exchange on external NOR flash

Link to Apply : **8524**

Work To Be Done

- ❑ Analyze the requirements and prepare SRS document.
- ❑ Implement the communication protocol between host and device base on Public key.
- ❑ Implement the device encryption/decryption using HUK shared key.
- ❑ Implement Host encryption/decryption using public keys.
- ❑ Write a demo showing the secure data exchange between multiple trusted hosts and device.

Purpose

The Goal of this project is to implement an application to let trusted hosts securely communicate with a device to access data on external NOR Flash memory.

Number Of Trainees Needed

01

Keywords

STM32, database, filesystem, middleware

Project_ID08 : LLM-Based Migration of Embedded Projects to STM32

Link to Apply : **8525**

Work To Be Done

- Structured Data Generation from Source MCU Documentation and Drivers.
- Static and Dynamic Analysis of the Embedded Project (peripherals, middleware and system features).
- STM32 MCU Selection Based on Feature Matching and Constraints.
- Software Emulation of Missing Hardware Features.
- Integration of LLM-Assisted Automation Tools.
- Validation and Testing on STM32 Hardware.

Number Of Trainees Needed

01

Purpose

Develop an AI-driven tool using Large Language Models to analyze and migrate embedded projects from non-stm32 MCUs to the most suitable STM32 device, automating peripheral, feature and constraint mapping

Keywords

STM32, LLM, MCU Migration, Peripheral mapping, Code refactoring, feature extraction

Project_ID09 : Improving DCMIPP Pixel Pipeline Validation

Link to Apply : **8526**

Work To Be Done

- ❑ Analyze current validation tests and structure.
- ❑ Define validation scenarios optimized for the pipeline use cases.
- ❑ Implement scenarios and their relative environments.
- ❑ Integration of the tests in the existing validation environment.
- ❑ Assess gains and coverage.

Purpose

This internship project aims to optimize Embedded Software testing processes by intelligently selecting tests most likely to detect defects, thereby reducing testing time and resource consumption while maintaining high software quality.

Number Of Trainees Needed

01

Keywords

STM32, DCMIPP, Pixel Pipeline, ISP

Ecosystem Support

Project_ID10 : GenAI Technical support - Data strategy on SNOW and Tools integration

Link to Apply : **9024**

Work To Be Done

- Automate execution of AI test cases, capture results, and generate reports.
- Measure the accuracy and completeness of the AI's responses.
- Assess user feedback and satisfaction with the AI's support.
- Track the frequency and types of errors made by the AI.

Number Of Trainees Needed

01

Purpose

This project aims to validate the generative AI for STM32 Technical support by ensuring accurate, relevant, and timely technical support.

It focuses on automating testing processes to enhance AI performance in handling technical queries, troubleshooting, and user guidance related to STM32.

Keywords

- Embedded C and STM32 MCUs
- Generative AI , LLM , OpenAI, Python
- AI testing automation
- Technical support optimization

Project_ID11 : STM32 RNG Characterization for NIST Certification

Link to Apply : **8593**

Work To Be Done

- ❑ Setup a process to extract continuous random bits and run statistical tests.
- ❑ Perform Entropy Source Validation (ESV) on STM32 RNG.
- ❑ Support NIST SP800-90b certification documentation.
- ❑ Update AN4230 to include latest RNG results and methods.

Number Of Trainees Needed

01

Purpose

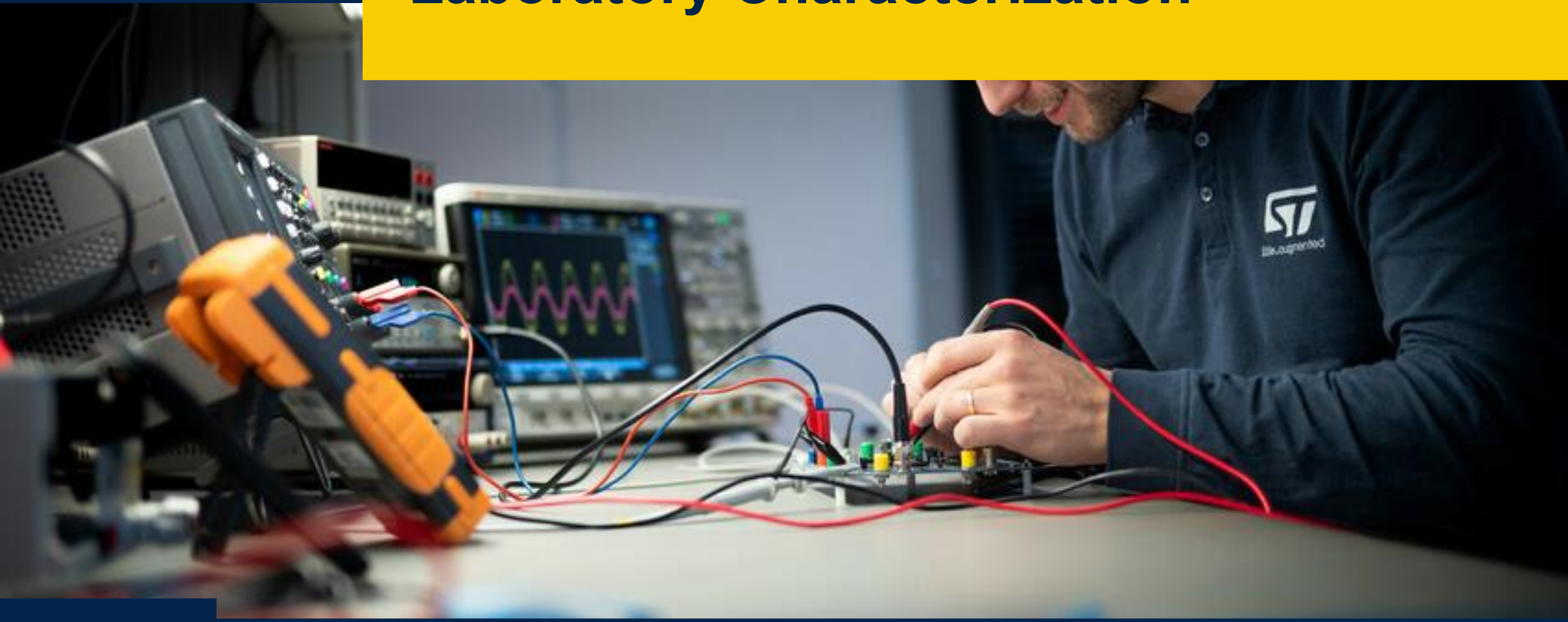
The project focuses on the characterization and validation of the STM32 Random Number Generator (RNG) Entropy to ensure high-quality randomness.

It aims to support compliance with the NIST SP800-90b certification standards for cryptographic security.

Keywords

- STM32 Embedded C
- RNG Entropy Source Validation
- Embedded Security, Cryptography
- Python and OpenSSL (Optional)

Laboratory Characterization



Project_ID12 : STM32 Digital Characterization : New Tester and Board bench for Teradyne

Link to Apply : **9023**

Work To Be Done

- ❑ Acquire technical knowledge on Teradyne J750 HW/SW ecosystem. through documentation study
- ❑ Design and develop a new PCB characterization board.
- ❑ Architect and implement software for the new testing methodology.
- ❑ Perform measurements, correlate with database data, and validate results.

Number Of Trainees Needed

01

Purpose

The project aims to develop a new test platform and characterization board for STM32 using Teradyne J750.

To improve digital IP measurement accuracy, it includes software design, experimental validation, and correlation of results with existing data for reliable characterization.

Keywords

- Embedded C and STM32 MCUs
- Debugging and instrumentation (Oscillo, …)
- Altium, Hyperlynx, MS Visual Basic, Python
- Optional: LabVIEW and AI Tools.

Tools Department

Project_ID13 : Automation of Security System Validation Bootpath Lifecycle

Link to Apply : **8298**

Work To Be Done

- Define complex uses cases for BootPath lifecyle usage from the End of user.
- Design and develop an application with complex defined use cases that tests the whole Cube ecosystem (STM32CubeMX, STM32CubeIDE, STM32CubeProgrammer and the STM32CubeFW).
- Integrate the implemented application with the whole Validation automatic platform.

Purpose

This internship project aims to study and develop advanced applicative use cases for Security System validation activity, covering the entire Bootpath lifecycle from project configuration, Project build to Project application execution on STM32 board.

Number Of Trainees Needed

01

Keywords

STM32CubeMX, STM32CubeProgrammer, STM32CubeIDE, STM32xx-MCU Architecture, Python / PyWinAuto, Robot Framework, UFT, Git

Project_ID14 : Development of a Framework for Testing the Performance and Robustness of the MX2 CLI/CoopAPI

Link to Apply : **8279**

Work To Be Done

- Automate the execution of MX2 CLI and Cooperation API Calls
  - Define test scenarios and command sequences.
  - Execute CLI commands and API calls.
  - Inject various parameters to introduce test variations.
  - Accurately record the execution time of each CLI command and Cooperation API call.
- Perform Measurement and Comparison.
  - Collect real-time performance metrics such as CLI/API execution time per command.
  - Evaluate the influence of CLI/API operations on the MX2 GUI interface responsiveness and stability.

Purpose

The objective of this project is to design and implement an intelligent automated framework to evaluate the performance and robustness of the MX2 Command Lines Interface (CLI) and Cooperation API. Additionally, the framework will assess the impact of the CLI/Cooperation API on the MX2 GUI interface

Keywords

Python, RobotFramework , Psutil Library, JSON, SQLite, HTML, Selenium, Jenkins

Number Of Trainees Needed

01

Project_ID15 : STM32CubeProgrammer incremental flashing enhancement

Link to Apply : **8277**

Work To Be Done

- Benchmark existing incremental programming solutions and compare them with ST solution.
- Define an enhancement strategy for ST solution.
- Design and develop the technical solution bringing ST programming tool to the level of most advanced incremental. programming implementations.
- Enhance the automatic test to cover the developed solution.

Purpose

This internship project aims to study and develop advanced incremental programming solutions for STM32CubeProgrammer tool.

The trainee will conduct a benchmark of existing solution and propose ways to enhance ST solution. In addition to the existing CLI solution, the trainee will develop a graphical interface supporting the incremental programming.

Keywords

STM32CubeProgrammer, STM32, C++, JavaFX, STLink.

Number Of Trainees Needed

01

Project_ID16 : Development of a Cross-Platform Application Manager for ST Software Tools

Link to Apply : **8383**

Work To Be Done

- Design and develop a user-friendly interface for listing applications and displaying their status.
- Implement features to launch, install, uninstall, and update each application.
- Ensure cross-platform compatibility (Windows, Linux, Mac).

Purpose

This internship project aims to develop a cross-platform desktop application that enables users to list, install, uninstall, update, and launch a set of ST applications.

This tool will centralize the management of ST software tools across Windows, Linux, and Mac platforms.

Number Of Trainees Needed

01

Keywords

STM32Cube Ecosystem, Electron, TypeScript, Windows, Linux, Mac

Hardware Department

Project_ID17 : Maintenance and lifecycle management of a STM32 MCU & MPU Evaluation Tool

Link to Apply : **8596**

Work To Be Done

- Monitor and manage obsolescence alerts for electronic components and identify suitable replacements.
- Redesign related promotion boards by ensuring compliance with design standards.
- Generate manufacturing files.
- Update production test packages to reflect hardware revisions.
- Revise and publish all technical documentation across internal and external platforms.
- Drive the management and synchronization of critical project milestones from the kick-off meeting to product release.

Number Of Trainees Needed

01

Purpose

This internship aims to ensure the long-term reliability and availability of STM32 MCU and MPU evaluation tools through proactive management of components obsolescence.

It offers hands-on experience in hardware maintenance and industrialization processes, providing valuable exposure to real-world product lifecycle challenges.

Keywords

STM32 MCUs, Altium Designer, Embedded C, Python, VBA, Subversion (TortoiseSVN), Microsoft Office (Word, Excel), Projects Management, Electronics knowledge

Project_ID18 : AI Assistant for Electronic Component Database

Link to Apply :8595

Work To Be Done

- Develop and refine an AI Document Interpreter able to read, summarize, and extract key information from technical documents (datasheets, application notes, etc).
- Implement a Component Adviser that provides component insights, propositions from the database, and quick technical guidance for component selection.
- Build a Dashboard Database Generator that creates statistics and dashboards for visualizing component attributes.

Number Of Trainees Needed

01

Purpose

This project aims to elevate the component database user experience with a smart engineering AI assistant by combining AI document understanding, real-time component recommendations, and automated dashboard generation.

The goal is to transform traditional component data into actionable intelligence that supports faster and more informed design decisions..

Keywords

- Electronic engineering tools – electronic components
- Python, Generative AI
- Data processing

Application & Product Support

Project_ID19 : Application Note on how to use PMU and ETR to debug and trace STM32 applications

Link to Apply : **8626**

Work To Be Done

- Overview of the STM32 debugging infrastructure.
- Definition and explanation of the Performance Monitoring Unit (PMU) and Embedded Trace Router (ETR), including their working principles.
- Identification of use cases where PMU and ETR are beneficial and guidelines on when to use each.
- Development of practical examples demonstrating how to utilize PMU and ETR to debug and trace applications, with step-by-step instructions for both IAR and Keil IDEs.

Number Of Trainees Needed

01

Purpose

This internship project aims to study and develop an application note that covers the new Debug and Trace unit :
- PMU: Performance monitoring unit
- ETR: Embedded trace router

Keywords

Embedded C, IAR, KEIL, STM32 architecture, Arm Cortex-M CPU, STM32 debugging

Sales & Marketing

Project_ID20 : Development of a Multi-Board Data Acquisition Solution Utilizing STM32 MCU using ethernet/PTP protocol for customer application

Link to Apply : **8814**

Work To Be Done

- Develop solution enabling coordinated data acquisition from multiple STM32 boards with accurate calculation and compensation for network latency.
- Integrate Precision Time Protocol (PTP) for precise time synchronization across multiple across board.
- Deliver functional example code, detailed documentation, and support materials to help the TOMAS team address advanced Ethernet synchronization and multi-board coordination questions.

Number Of Trainees Needed

01

Purpose

The purpose of this work is to create a highly accurate and synchronized multi-board data acquisition platform using STM32 MCUs and PTP technology, enabling customers to collect and analyze time-critical data with precision and reliability across distributed systems.

Keywords

Embedded C, IAR, STM32CubeMX,HAL drivers, Middleware, PTP, Ethernet

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