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## IEEE, STMicroelectronics INTERNSHIP INITIATIVE

STMicroelectronics is a world leader in providing the semiconductor solutions that make a positive contribution to people's lives, today and into the future. Offering one of the industry's broadest product portfolios, STMicroelectronics serves customers across the spectrum of electronics applications with innovative semiconductor solutions for **Industry 4.0** and the **Internet of Things**. By getting more from technology to get more from life, STMicroelectronics stands for *life.augmented* (visit [www.st.com](http://www.st.com) for more details).

**System Research and Applications** (SRA) is the System R&D organization established to address the need of the Company to increase system know-how and to scout new technologies. SRA is looking to highly motivated, high potential students (under graduated, graduate, PhD) to fill internship positions and be involved on break-through, exciting, and innovative projects on **Artificial Intelligence for Embedded Systems**. Here the theme proposed:

- 1) **Unsupervised Learning** for Artificial Intelligent Cyber Physical System. CPS is a network of interacting computing systems, each one capable to measure and learn from a single physical quantity (e.g. temperature, acceleration, etc). The objective is to bring break through unsupervised learning intelligence inside embedded micro controllers **STM32**. Embedded intelligence will exploit resource constrained micro controllers to demonstrate Artificial Intelligence is feasible on the edge this internship has the target to develop firmware/hardware computational intelligent algorithms and deploy based on STM32 components. The student will (1) study STM32 micro controllers and STM32Cube.AI tool (2) study unsupervised artificial neural networks and Keras deep learning framework (3) implement and evaluate performances and behavior in a quantitative way with field trials. (4) Report deviations from expected functionalities with explanations and in depth analysis.
- 2) **Reinforcement Learning** for the inverse pendulum test case. The objective is to bring reinforcement learning inside embedded micro controllers STM32 attached to mechanical hardware featuring a pendulum controlled with a step motor. This internship has the target to develop firmware/hardware and deploy based on STM32 Nucleo components. The student will (1) study STM32 micro controllers and STM32Cube.AI tool (2) study reinforced artificial neural networks (3) implement and evaluate performances and behavior in a quantitative way with field trials on the ST inverse pendulum. (4) report deviations from expected functionalities with explanations and in depth analysis.

Internships, limited to students, may take:

- 1) Up to 12 months for undergraduate MSc and PhD students
- 2) 6 months for graduated MSc

We look to very interested people, well committed to the project until the end of the internship period that will be regulated by a contract. The candidate has to be knowledgeable in C/C++, Keras and python languages. Knowledge on Linux OS required. It shall have attitude to work diligently in a team of experts and with reliable creativity. Education in Software, Mathematic Engineering and Computer Science is required.

STMicroelectronics accordingly to his recruiting rules will offer salary that will be discussed during the formal interview. Language requirements are English or Italian.

For more information please contact

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System Research and Applications

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Agrate Brianza, Italy