



## Internship offer – Robot Self Docking

Founded in 2003, InvenSense Inc., a TDK Group Company, is the world's leading provider of MEMS sensor platforms. InvenSense's vision of Sensing Everything™ targets the consumer electronics and industrial markets with integrated Motion and Sound solutions. Our solutions combine MEMS (micro electrical mechanical systems) sensors, such as accelerometers, gyroscopes, compasses, and microphones with proprietary algorithms and firmware that intelligently process, synthesize, and calibrate the output of sensors, maximizing performance and accuracy. InvenSense's motion tracking, audio and location platforms, and services can be found in many of the world's largest and most iconic brands including smartphones, tablets, wearables, drones, gaming devices, internet of things, automotive products, and remote controls for smart TVs.

InvenSense is headquartered in San Jose, CA and has offices in Boston, China, Taiwan, Korea, Japan, France, Canada, Slovakia, and Italy. We're looking for top-notch students to join our global intern team. If you're interested in being a part of our journey and helping us grow to become the leading provider of SoC platform solutions, we definitely want to hear from you.

We are looking for motivated students to join our 2020 Summer Intern Program! Our intern program includes real work assignments, Intern Appreciation Day (interacting with CEO and VPs), Networking Lunch with hiring managers, technical talks, New Hire Panel with recent grads, play with technology, off-site fun events, and more!

### Overview/Job Summary

Autonomous Robot has been around since many decades to achieve exceptional mission (outer space, hazardous situation). With the technology progress, such autonomous robots are getting more affordable and being introduced for human daily mission such as food delivery, house and yard keeper. Robots need to navigate through public places and interact with human environment.

TDK is the leader of MEMS such as Chirp Microsystem Ultrasonic sensors and InvenSense IMU sensors. TDK high precision sensors are widely used for high performance applications such as robotics, drone control, virtual reality. IMU can be used to solve the robot dynamics and track its motion. Small robots can only be equipped with small size sensors. Due to their small sensor size, multiple (CH-x01) Ultrasonic sensors can be integrated on the same platform, where sensors can be programmed in transmitter and/or receiver mode. The CH-x01 Ultrasonic sensors provide high accuracy range estimate.

The goal of the internship is to complete self-docking mission of an autonomous robot. The robot will be equipped with one IMU and two Ultrasonic sensors and the docking station with one or more Ultrasonic sensors.

### TDK – InvenSense

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Sensor System Business Group  
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As part of the Software Engineering Team in Grenoble, your goal will be, first, to build a comparative analysis and to benchmark the various tools and frameworks available on the market for choosing the appropriate solution according to TDK-InvenSense's specific needs, and second, to integrate this solution into the development team workflow to facilitate the deployment of those new algorithms on the final products.

#### **Tasks**

- Learning: get familiar with hardware.
- Characterization: database collection and annotation.
- Implementation: prototype solution using Python or C.
- Evaluate and tune real-time robot control and docking mission.
- Demo: real-time robot self-docking mission.

#### **Skills required:**

- Programming in C/Matlab/Python.
- Good knowledge of signal processing, control and estimation theory.
- Knowledge of microcontroller and firmware development is a good plus.
- Pugnacity and creativity are paramount skills for this challenging problem.

**Contract** : Professional Internship

**Qualification required** : Bac+5 program

**Dates** : To be defined

**Duration** : 6 months

**Where** : Grenoble

Thank you to send your curriculum vitae via email and cover letter to [jyoussef@invensense.com](mailto:jyoussef@invensense.com)

• Stage Chief: Joe Youssef

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