Internship offer – Comparative analysis of Machine Learning tools and framework for runtime inference on microcontroller

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

TDK-InvenSense is developing new advanced features for its products, leveraging machine learning algorithms such as (Convolutional) Neural Networks. Indeed, for now a few years now, there's a confirmed trend for sensors to embed more intelligence, and namely extract meaningful compressed data that are based on Machine Learning. The information is so compressed at the sensor level node and there's no need to flow huge data up to the cloud to deliver meaningful decisions.

For integration and power consumptions concerns, those algorithms need to be executed on very constraints environment as part of the sensor IC.

TDK-InvenSense is looking for existing solutions to export machine learning based algorithms, running on PC to run on microcontroller.

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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.

Job Description

- Work closely with the algorithm and integration teams to gather requirements and metrics according to machine learning models and runtime environment constraints
- Build a list of existing tools and frameworks available on the market for converting machine learning models designed with Tensorflow and SciPy to run on Cortex-M based microcontroller
- Design a qualitative and quantitative benchmark to assess performances of the identified tools and framework to help the team deciding on the most suitable solution to use in TDK-InvenSense products
- Create scripts and test software to integrate the solution as part of the continuous integration workflow
- Software environment and language:
  - C/C++
  - Python
  - Tensoflow/Keras and SciPy/Numpy
  - Cortex-M based MCU
  - Git and github

Contract: Professional Internship
Qualification required:

- 4th or 5th year student in Engineering School or master's degree in computer science
- Good English and communication skill
- Autonomy and initiative are a must have
- Previous experience in firmware development and working with microcontroller
- Previous experience with python and basic knowledge of machine learning is a plus

Dates : To be defined
Duration : 4 to 6 months
Where : Grenoble

Thank you to send your curriculum vitae via email and cover letter to pbesson@invensense.com
• Stage Chief: Paul BESSON

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