EMBEDDED SOFTWARE

August 2016

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Competences

Practices

- Software Product Design and Prototyping
- Firmware Development
- Test Design, Execution and Reporting
- Test Automation
  - NI LabVIEW and TestStand
  - Scripting Languages
- Systems Engineering
- Support and Maintenance

Processes

- CMMi, Scrum, PMI, ISTQB

Head Count

- 400+ engineers in the company
- 120+ engineers in Product Engineering
  - 50% in Automotive Embedded
  - 10% with Masters Degree
  - 40% in Testing roles and 60% in Development roles

Domains

- Multimedia
- Telematics
- Connectivity (Automotive-CAN, Wireless, Bluetooth, GPS, USB, UART)
- Power Management
- Reflash
- Home Automation

Platforms

- Languages: C, C++, Python, Go, Javascript, ARM Assembly Language
- Operating Systems: Linux, Android, RTOS (eg Micrium *µC*/OS-II, FreeRTOS)
- Protocols: I2C, CAN Buses (OBDII, Heavy Duty), CAN Protocols (J1850, KWP, J1939, J1708)
- Hardware: ST, Freescale iMX, TI OMAP, Intel Atom
- Home Automation: Apple Homekit Accessory Protocol

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Technologies

Multimedia

- Speech codecs: G.711, G.722, AMR-NB, AMR-WB, GSM-HR, GSM-FR, ADPCM.
- Audio codecs: MP3, AAC, eAAC+, WMA.
- Video formats supported: MPEG-4, MPEG-2, H.263, H.264, VC-1, WMV.
- Hardware: Camera, Display, Postprocessor, Video Stabilization.
- Multimedia containers: MP4, AVI, WAV, ASF, Matroska.
- Video teleconference (VTC) using RTP/ RTSP, payloaders/depayloaders.

Power Management

- OMAP4
- Display Subsystem

Home Automation (Apple Homekit)

- HAP
- SRP/OpenSSL/LibSodium)
- I2C and MFi Authentication Coprocessor
- HTTP, TLV, JSON
- Homekit Testing Tool

Automotive

- Buses
  - » OBDII
  - » Heavy Duty
- * Protocols
  - » J1979
  - » J1850
  - » KWP
  - » J1939
  - » J1708
  - » GMLAN

Telematics

- GPS (NMEA & Device Specific)
- Accelerometer
- PND Integration
- Connectivity technologies
- Automotive technologies

Connectivity

- Cellular Communication
  - » CDMA
  - » 3G/2G
- Serial / Xmodem
- Bluetooth
- WiFi

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Tools

Laboratories

- Monterrey Lab
  - Capacity for 8 concurrent users
  - 6 benches
- Guadalajara Lab Area
  - Capacity for 4 concurrent users, space for growing it if needed
  - 4 benches
- Both labs equipped with:
  - Soldering Station
  - EDS Protection (Ground, Floor, Tablemats / Wrist Strap)
  - Physical Ground

Equipment

- Oscilloscopes
- Multimeters
- Saint II Bus Monitor
- mOByDic ECU Simulators
- Power Supplies / Keithleys
- RF Boxes
- Aardvark
- Gryphon
- NEOVi
- Temp Chambers
- JTAG

Platforms and Licenses

- QNX Momentics Development Suite
- SciTools Understand
- Atlassian Jira
- Jenkins
- Testlink
- Valgrind
- CPPCheck
- GIT/Gerrit

Development Boards

- QNX M
- Mbed
- GPS devboards
- ARM STM32 Microcontroller devboards
- Modem devboards

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Product involvement

PRODUCT	INVOLVEMENT	INDUSTRY
Smartphone Platforms	- Software design and development. - Test Design, Planning, Execution and Reporting. - Automated testing design and development.	- Semiconductors
Electronic Monitoring Bracelet	- Test Design, Planning, Execution and Reporting	- Electronic
Vehicle Telematics	- Test Design, Planning, Execution and Reporting. - Automated testing design and development.	- Telecommunication
Vehicle ECUs	- GMLAN Reflash development and testing. - Maintenance & New Feature Development	- Automotive
Vehicle Infotainment	- Maintenance & New Feature Development	- Automotive
Battery Management Systems	- Test Design, Planning, Execution and Reporting. - Automated testing design and development.	- Semiconductor
USB Power Delivery Controllers	- Automated testing design and development.	- Semiconductor
Home Automation	- Software development and maintenance	- Consumer Electronics

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AUTOMOTIVE SUCCESS STORIES

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Projects Summary

1. Electronic Instrument Cluster for Tier 1 Client
2. Infotainment Solution for Tier 1 Client
3. CAN Reflash for Tier 1 Client
4. Cyber Security for Tier 1 Client
5. Testing and Systems Engineering Extension for Tier 1 Client
6. Aftermarket Fleet Mgmt for Telematics Company
7. Vehicle Telematics for Embedded Services Company
8. Infotainment Sol. For an Agricultural Machinery Company
9. Diagnostics, Reflash and Algorithms for an Agricultural Machinery Company

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