MASTER THESIS - LINUX AND AUTOSAR MULTICORE COEXISTENCE

The automotive industry currently faces big challenges in creating the next generation of embedded software for future cars. Embedded Linux is typically used to run infotainment systems and Autosar (autosar.org) is typically used to run real-time applications. Combining the use of Linux and Autosar on one CPU would be one way to leverage multi-core CPUs to lower the cost of producing embedded systems in future cars.

This master thesis should investigate how a multi-core CPU can be used to run Linux and Autosar simultaneously on the same chip. Many challenges need to be investigated, for example the use of shared resources, and communication between Linux and Autosar on different cores. Furthermore an implementation could be developed and tested using the ArcCore Autosar stack and a selected Linux distribution.

MASTER THESIS AT ARCCORE

Our Master Thesis projects require a good knowledge in embedded systems design and/or eclipse-based development. We prefer Master Thesis projects handled by two students but we also accept projects handled by one student. We expect interested students to participate in detailing the Master Thesis to adjust the content according to interest and profile of the students. Please contact Mattias Ekberg at mattias.ekberg@arccore.com or 0737082765 for questions.

ABOUT ARCCORE

ArcCore develop advanced real-time platforms for the Automotive industry. Thanks to open source and open standards we have taken a firm place at the market and reached worldwide spread. This year ArcCore was accepted as one of the most innovative tech companies in Sweden to Ny Tekniks 33-list.

OTHER PROPOSALS

Please see the next page for our current master thesis proposals.
### SALES AND MARKETING

**V2X COMMUNICATION**
Evaluate the growing market in Vechilce-2-Vehicle and Vehicle-2-Infrastructure communication. Both from a technical and economical point of view.

**CONTROL SYSTEM MARKET**
Evaluate and collect information of embedded control system market from an industry segment perspective.

**AUTOMOTIVE SUPPLIERS**
Evaluate and collect information of the supplier structure in the automotive market.

### UI DESIGN AND USER COMMUNICATION

**USER INTERACTION IN MODEL BASED DEVELOPMENT**
Develop good UI design patterns to use when working with model based development.

**USER COMMUNICATION**
Create a concept how to communicate with users in documentation, web-page and other social media.

**CUSTOMER PORTAL**
Create a web-based delivery area for customers to access documentation, licenses and binaries.

### PROGRAMMING (EMBEDDED & HOST BASED)

**INNOVATIVE GUI DESIGN FOR MODEL BASED DEVELOPMENT TOOLS**
Develop examples of GUI to configure complex system in a user friendly way.

**VISUALIZATION OF AN AUTOSAR SYSTEM**
How to visualize a large system without missing the details

**VIRTUAL AUTOSAR ENVIRONMENT ON LINUX**
Developing and running an Autosar system on a Linux platform.

**SMALL-SCALE PLATFORM**
Develop a minimal Autosar system that can run on CPU with limited memory and execution resources.

**LET AN ANDROID SYSTEM INTERACT WITH AN AUTOSAR SYSTEM**
Enabling an Android system to communicate in an Autosar environment.

**TIME SUPERVISION**
Add timing protection to an Autosar real-time system

**FAST PROTOTYPING IN AUTOSAR**
Develop a concept for fast prototyping of Autosar applications.

**AUTOSAR AND LINUX COEXISTENCE**
Use a multi core CPU to run Linux on one core and Autosar on another.

### TESTING

**AUTOMATED TESTING IN MODEL BASED DEVELOPMENT**
Finding methods to generate and execute unit tests in a model based environment.

**PERFORMANCE MEASUREMENT**
Develop and apply performance measurements to an embedded system.

**AUTOMATED TESTING OF HARDWARE**
Develop and setup an automatic test environment for hardware tests. Evaluate different test strategies for system tests.