AMRITA
VISHWA VIDYAPEETHAM
UNIVERSITY
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University at Buffalo *The State University of New York*
REACHING OTHERS

CSE 651   Emerging Applications and Platforms   June 6, 2014

Course Description

Typical automobile today relies heavily on embedded computer systems. This course will cover emerging applications and platforms relevant to automotive embedded systems. Course modules are designed to provide an excellent working knowledge of applications, tools and environments in automotive embedded systems area. This course will also have a project component in the capstone style. Topics covered in Emerging applications and platforms include:

- Embedded system Arduino platform and its ecosystem;
- Data Science and Predictive analytics platform of R-statistical modeling and analysis, and proactive problem diagnosis;
- Android-Arduino-CAN forming the OpenXC standard, Android SDK and app development;
- Cloud computing for supporting communication and data storage for automotive sensor data and algorithms for autonomous vehicle control and connected vehicle technology;
- Web application development using HTML5 (Javascript, Cascading Style sheet, HTML) and explosion of very rich and useful javascript libraries;
- Easy visualization application development using Processing.org Java library.

Topics in project development will include:
- Problem identification: Problem will be in the automotive or relative application domain and will be at the interface of hardware and software.
- Requirement analysis: Students will analyze the requirements of the problem identified by discussing it with the stakeholders. Design of a solution: Students will design the solution for the requirements and represent the design using design methods studied in other courses.
- Implement the design: Implement the design using best practices studied on hardware/ embedded systems and test the implementation (eg.: arduino, raspberry PI hardware)
- Document the design and implementation: Document the above processes and all the details of the project using suitable methods (eg.: class diagrams, state diagrams)
- Communication: Present the project and demonstrate the working to an audience of stakeholder and peers.

On completion of this course students will be able to (i) understand the components and working of the emerging applications and platforms discussed above, (ii) Design and develop applications for automotive domain problems, and (iii) apply project development methods.

Course Information

Website: http://www.cse.buffalo.edu/~bina/amrita/cse651B
Instructor: Bina Ramamurthy (bina@buffalo.edu)

Textbook and other material

We will use **several references** for **Emerging Applications and Platforms** that will be given during the lecture.
The automotive textbook for this course is and is available as ebook on UB library online:
Automotive Embedded Systems Handbook
Edited by Nicolas Navet and Françoise Simonot-Lion
CRC Press 2008
Print ISBN: 978-0-8493-8026-6
eBook ISBN: 978-0-8493-8027-3

Pre-requisites

The course and the lab work revolves around strong design, which you have all been exposed to since Programming/Computer Science I and II and digital systems knowledge.

Grading Distribution

Grades will consist of the following components:

Component (Quantity)	Percentage
Project	30%
Tests (2)	10%, 10%
Final Exam	50%

Point distribution guideline will be as follows:

Percentage	Letter Grade
95.00-100	A+
85.00-94.99	A
75.00-84.99	B+
65.00-74.99	B
55.00-64.99	C+
50.00-54.99	C
45.00-49.99	D
0-44.99	F

I reserve the right to alter component weighting or provide a "curve" on an assignment as warranted.

Miscellaneous

Please do not hesitate to talk to me, give me feedback about anything related to the course or the management of the course. You can talk to me after every lecture as well as through email.