

Design Project Topics

- EHV Control Strategy for EcoCar Contest
- EHV Conversion and Control of GM EV1
- Distribution Fault Location – San Diego Gas & Electric
- Ideas from Northrop-Grumman
- Ideas from Chrysler

EHV Control for EcoCar Contest

- Challenge X
 - Sponsored by GM and DOE
 - HU: 1 of 18 that made the cut
 - 2 more years
 - 2008-2009: EHV architecture and control strategy
 - 2009-1010: Implementation and Assembly
- Project
 - Selection of EHV architecture
 - Determination of Components
 - Simulation Analysis for Fuel Economy and Emission Standard
 - Development and Simulation of Control Strategy
- Team
 - 4 seniors
 - 2 juniors



EHV Conversion of GM EV1

- EV1
 - Electric Vehicle Donated by GM in 2001
- Project
 - Conversion of EV1 to a range-extended EHV
 - Building up a scaled-down test stand of the determined architecture
 - Detailed design for full scale system
 - Led by Dr. Jason GanLey (Chemical Eng.)

Distribution Fault Location

- Multiple “locations” of a fault due to the multiple circuits in a substation where the measurement for fault location is performed.
- Selection of the best fault location algorithm
- Use of outage management and distribution management and other networked database tools to pin point the fault location

Suggested Topics from NGES (Northrop-Grumman Electronic Systems)

- 22 topics were suggested as senior design projects to HU around summer (for EE, CpE, and ME students)
- Students learn by experience on projects that are realistic and satisfy certain business needs of NGES.
- Project Contents:
 - a new design, a product improvement, or a process, equipment, or systems improvement.
 - have clear deliverables and
 - a member of the Northrop Grumman technical staff as a technical focal point.
- I selected 7 topics from the list and submitted to Dean's Office through ECE chair

7 NGES Projects (first 3)

Topic	NGES#	SENIOR PROJECT	DESCRIPTION	SPONSOR	Possible Faculty Advisor
1	12	EMI Testing of Coated/Plated Non-Metallic Electronic Enclosures	The objective of this project is to understand the shielding capabilities of various plating and coating of non-metallic composite electronic enclosures. This progresses internal efforts by NGC of reducing weight to our current electronic enclosures.	R.Russell/ O.Myers	Dr. Dimian/Dr. Kim
2	19	Sysgen or Synplicity DSP "Math Library"	FPGAs are becoming more math-oriented, and the math functions are becoming more complex than just "multiply-accumulate". Sysgen (for Xilinx designs) and Synplicity DSP are desirable design entry programs for this type design. This project would build standard building blocks that could be used as primitives by programs needing them. Sample blocks include reciprocal, division, square root, trig functions, logarithm and exponentiation. Designs could be hardwired-size fixed point, programmable-size fixed point or floating point. This project requires access to either Matlab/Sysgen or Synplicity DSP for design entry and simulation and possibly an FPGA Place & Route tool (e.g., Xilinx ISE, Altera Quartus) for implementing the designs in hardware to measure the size and timing. Access to hardware is not needed.	E. Lawhon	Dr. Gloster /Dr. Anders
3	20	Asynchronous Glitches in FPGAs	It is well known that combinational logic is prone to generating spikes when multiple inputs transition. These spikes are most commonly dealt with by using synchronous design techniques so that the clock can filter out the spikes. There are times, however, when the design must have asynchronous logic, especially at the interface between two clock domains. On a board, the technique is to "blank" these spikes by using gates whose outputs won't transition while the spikes are occurring.	E. Lawhon	Dr. Gloster

7 NGES Projects (the rest)

4	38	Wireless Underwater Power Connector Design	There is a need to do remote power connections for charging batteries in UUVs in the water, at water depths up to 300 ft. The precision of the blind-stab connection can be vastly reduced if the connection and power transfer can be made inductively. GM has developed an inductive power connector for use on/in one of its electric cars. This technology may be adaptable to underwater use. Investigate state of the art and assess viability of technology for underwater use, if viable, develop plan to build and test proof-of-concept prototype.	D.Barvenik, J.Mennucci	Dr. Kim
5	43	Systems Power Management Methodology	Develop a generic and broadly reusable power management methodology to reduce overall power consumption of defense and military products involving electronics and multiple subsystem elements.	G.Mastenbrook	Dr. Momoh/Dr. Kim
6	47	Burst-Mode UWB/Optical Voice Link	Develop a Low Probability of Detection, Low Probability of Interception (LPD/LPI) optical communications system incorporating wide band or burst mode optical links and supporting two-way encrypted (AES/equivalent) voice services.	G.Mastenbrook	Dr. Chouikha
7	50	Avoiding Ad-Hoc Route Expiration	We would like to develop a method by which route expiration in Ad-Hoc On-Demand routing algorithms can be avoided and by which the true "shortest path" is determined.	T. Hennen	Dr. Chouikha

Daimler-Chrysler

- TBD

Design Topics Solicited

- Design Topics Needed
- Bring your design ideas to the class
- Industry initiated topics are highly sought
- Bring the topics with following items:
 - Title of the project
 - Problem Statement of the project
 - Background Information
 - Needs, sponsors, importance, impact, etc
 - Functional and Design Requirements, if possible
- **Contact your lecturer for the steps to present your ideas in the class.**

Back to Design Requirement Assignment

- EcoCAR
- EV1
- SDG&E
- 7 NORTHROP-GRUMMAN PROJECTS
- CHRYSLER