Guest Speaker Series for Senior Design 2008-2009

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Life at Howard

- EE – Class of 2005
- Lots of sleepless nights
- Very well-rounded experience
- Life-long friendships
- Adaptability and Perseverance
- Priceless moments

In your Chair

- Exactly 3 yrs ago…
- Lots of excitement and anticipation
- Seniorities
- Tons of unforeseen opportunities in the future
- Appreciation / Dissatisfaction for some college experiences

Some lessons from Howard

- Lots of experience with Interviews
- Confidence to perform
- Problem-solving skills
- Dealing with people of diverse backgrounds
- Workforce practice through team projects
- Internship experiences

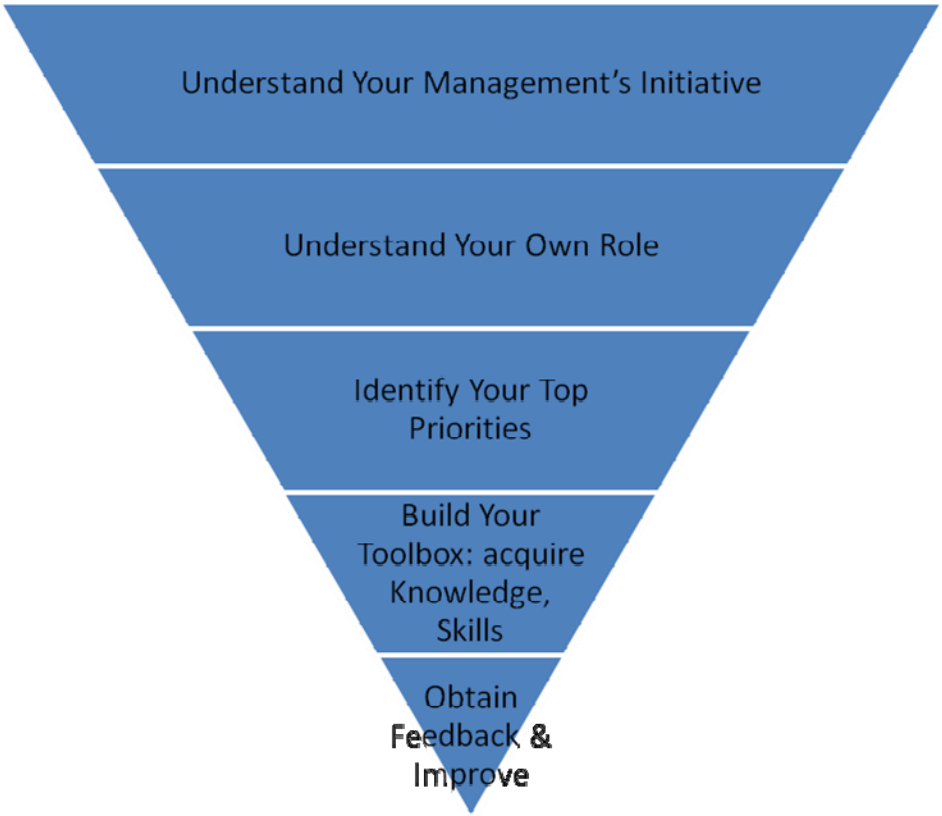
Transitioning into the Workforce

- Ability to learn quickly
- Effectively applying theoretical knowledge to practical applications
- Communicating with appropriate terminology
- Understanding your audience
- Dress code and Business ethics

Transitioning into the Workforce (Cont'd)

My Accomplishment Cycle

Keys to Success



Automotive Experience

General Motors Stamping Plant (Pittsburgh) – 3 Summer Internships

- Programming Weld Machines
- Automating Manual Data-Collection Systems
- Troubleshooting Production Stoppages

Chrysler Institute of Engineering Leadership Program: Aug 2005 – Dec 2007

- Material Cost Management
- Hybrid Development
- Active Chassis Controls (ABS, ESC, Adaptive Cruise, etc…)
- Sebring / Avenger Assembly Plant
- Electro-Magnetic Compatibility (EMC) Lab
- Product Strategy (Portfolio Analysis)

Plant Vehicle Engineering – Newark Assembly Plant

- Durango & Aspen SUVs
- Hybrid Electric Vehicles
- Audio & Telematics, Electrical Wiring

What about the Car is Electrical?

Wiring	Modules	Others
• Current Conductors • Module Communication • X-By-Wire Communication • Connection hubs	• Audio Systems • Electronic Control Units • Engine Controller • Integrated Modules	• Batteries • Fuses • Lightings • Switches and Buttons • Entertainment Systems

HEV!!!

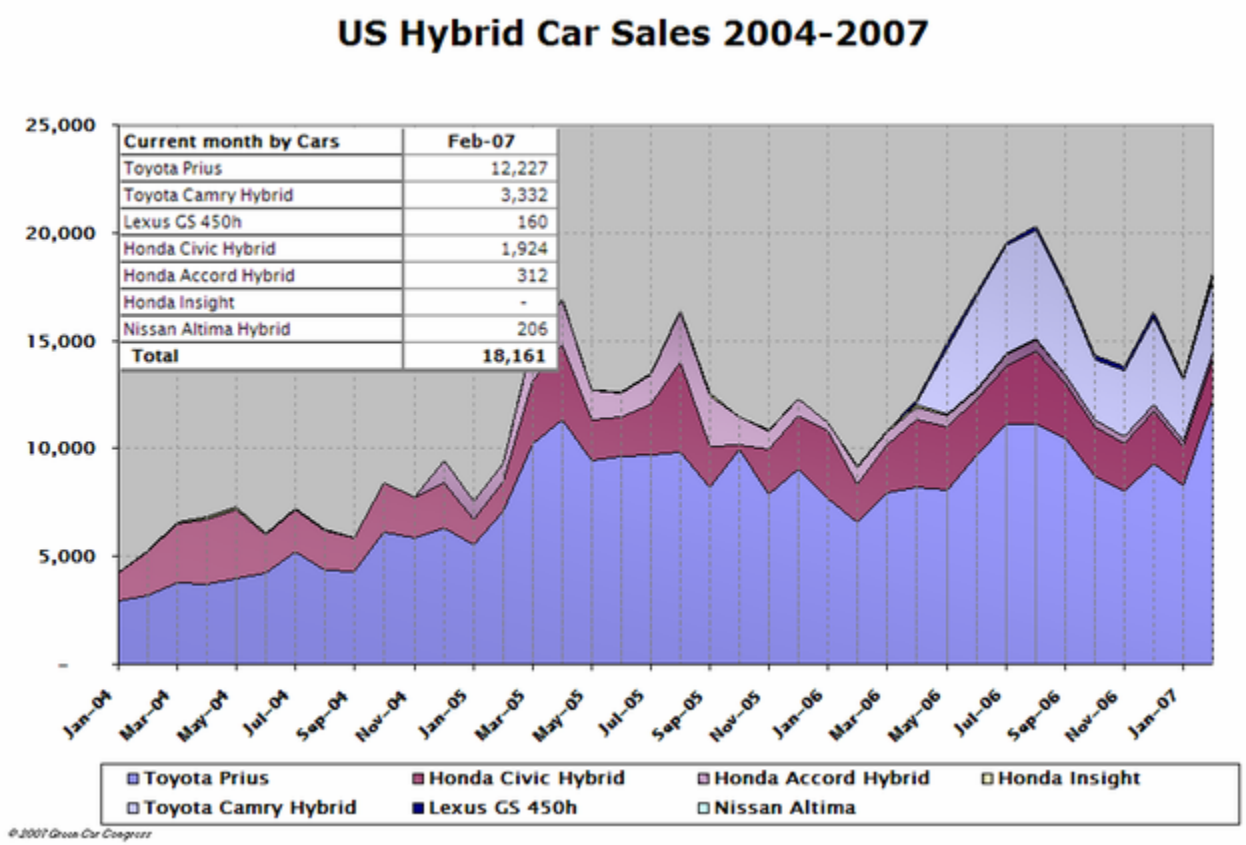

DODGE
Home | Español | Dodge Goods
Audio Off
Search Dodge.com
Select a Vehicle
Find a Dealer
ZIP
Shopping Tools
Build My Own
The Dodge Experience
For Owners
2009 Durango HEMI® Hybrid
Overview
Photos
Features
Press Release
Get Updates
HEMI Hybrid Technology
Cutting Edge. Standard.
Finally, a full-size SUV loaded with fuel-saving[1] hybrid technology and all the power and performance you expect from Dodge. Setting the standard in versatility, utility and fuel economy[1], the 2009 Dodge Durango HEMI® Hybrid changes everything, while compromising nothing.
Want to be first to launch your boat on Saturday morning? Done. Durango HEMI® Hybrid, with its burly 5.7-liter HEMI®, tows 6,000 lbs. without breaking a sweat. Want to enjoy a nearly 40-percent fuel reduction[1] while running errands in the city? Done. This patented system dramatically improves fuel economy[1] around town and on the highway.
The 2009 Durango HEMI® Hybrid
40% more fuel efficient in the city.[1]
(Yeah, it's still a HEMI.®)
HYBRID
TWO MODE HEMI
FLEX FUEL
SIGN UP FOR UPDATES
AUTOSHOW

Hybrid Technology Major Components

Hybrid combines conventional propulsion system with rechargeable energy storage system

Rechargeable High Voltage Battery (300V) to store energy	**Regenerative Braking System** to recover energy from braking	**Electric Motors** to help drive powertrain & **Electric Generator** to recharge Battery	**Electrically Variable Transmission** to provide energy-efficient ICE gear shifts	**Traction Power Inverter Module** to control Transmission operation	**Electric Power Steering** **Electric A/C Compressor** **High Voltage Wiring** **High Voltage Interlocks**

HEV Market Growth



Current month by Cars	Feb-07
Toyota Prius	12,227
Toyota Camry Hybrid	3,332
Lexus GS 450h	160
Honda Civic Hybrid	1,924
Honda Accord Hybrid	312
Honda Insight	-
Nissan Altima Hybrid	206
Total	**18,161**

Various Technologies

	Gas-Electric Hybrid	Plug-in Electric	Fuel Cell	E-85
Technology	Pros: Boosts fuel efficiency Cons: Higher initial cost, & continued reliance on ICE	Pros: Nearly eliminates gas needs Cons: Relies on expensive Li-ion batteries (under development)	Pros: Completely eliminates need for gasoline engine and only exhaust is water Cons: High hydrogen cost & few fueling stations	Pros: Runs on 85% ethanol from corn & just 15% gas Cons: Rising food prices
Who's Winning	Toyota, followed by Honda	GM was first with plans to develop Chevy Volt. Toyota vowed to match 2010 production	Honda, with its FCX Clarity, took the lead in sales, but GM and Ford have largest test fleets	Domestic automakers. GM claims 3M of the 7M E-85 vehicles on the road today
What's Next	All major automakers aggressively chasing segment	Watch for a slugfest between GM and Toyota for leadership in this technology	Continued testing of fleets, as well as efforts to develop an infrastructure	Research into alternative methods of developing ethanol underway

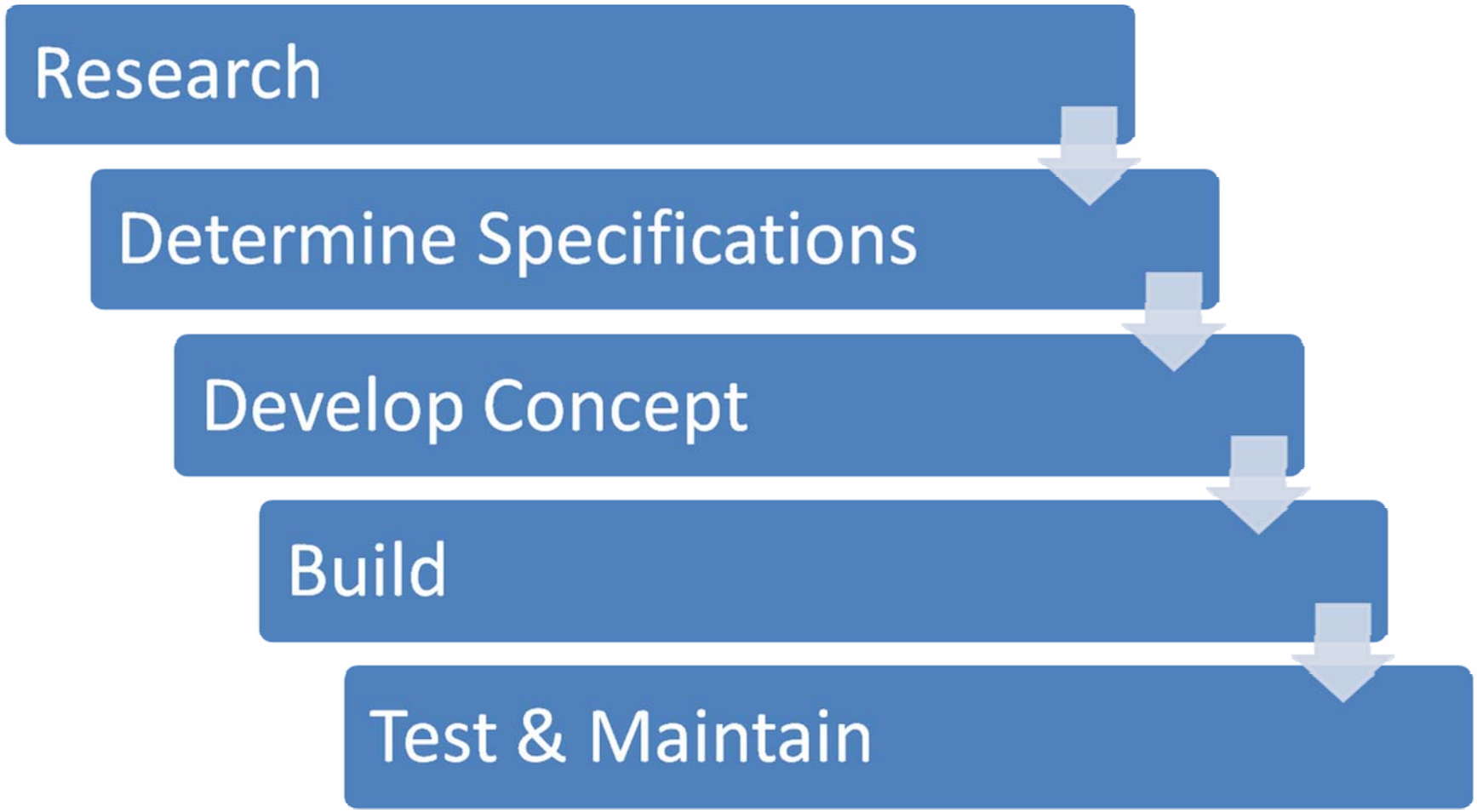
Giving Back

- Sacrifices on your behalf
- Where the Scholarships come from
- Non-monetary Contributions
- Baby-steps

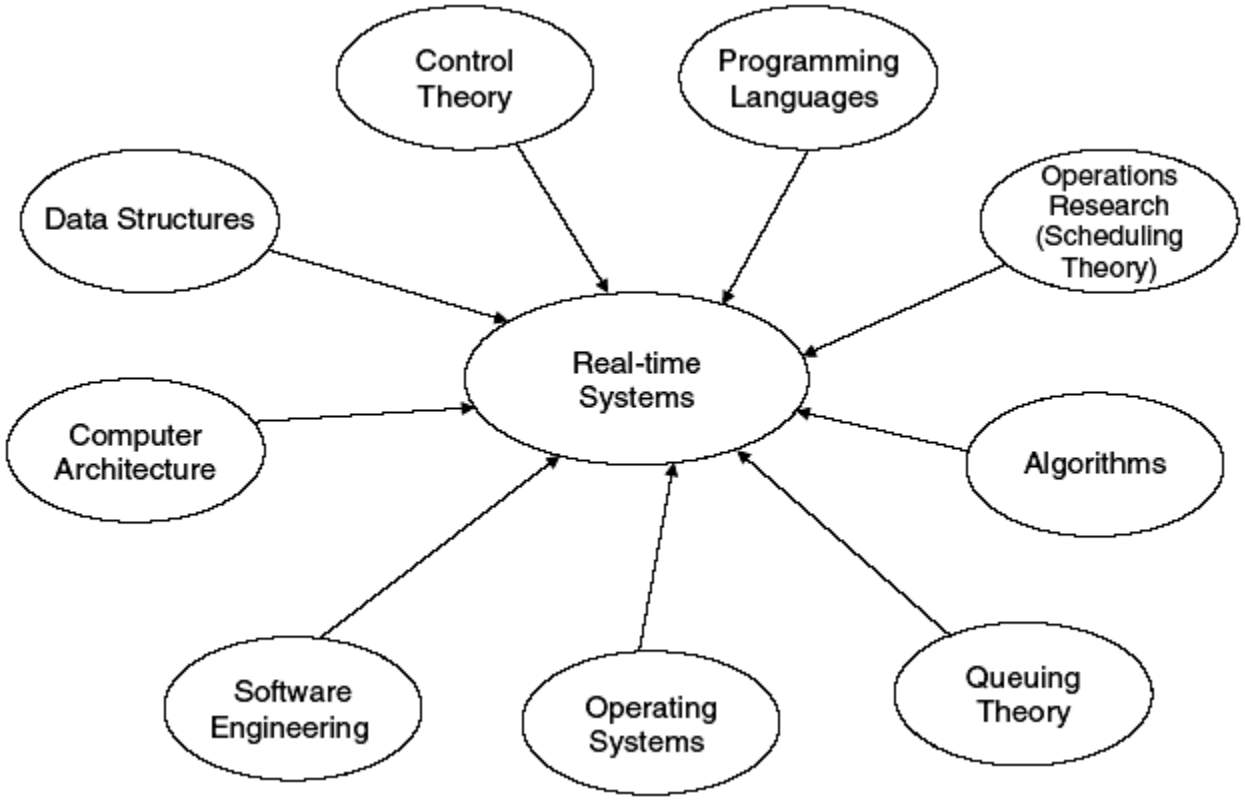
Senior Design Experience

- Design Cycle
- Time Management
- Financial Management
- Testing and Troubleshooting
- Continuous Improvement
- Pride in Excellence

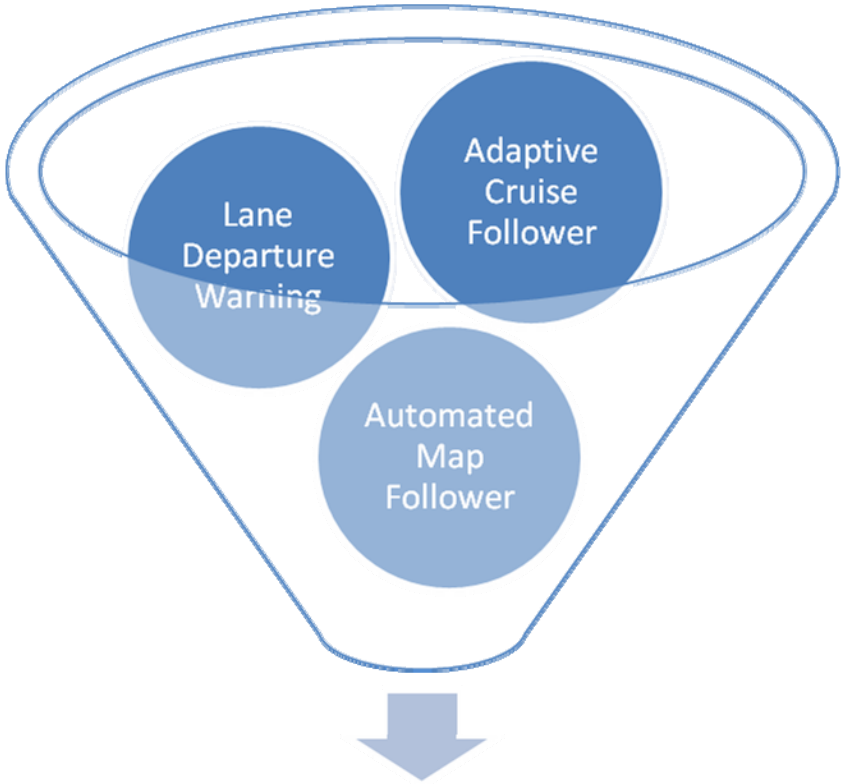
The Design Cycle



Various Disciplines that Affect Real-time Systems



A Proposed Senior Design Project



Intelligent Vehicle Concept

The Intelligent Vehicle

Adaptive Cruise

- Follow lead vehicle/object at maximum allowable speed
- Avoid colliding with lead vehicle
- Be able to move at maximum rated speed if no lead vehicle present

Lane Departure Warning

- Warn when drifting between lanes
- Allow lane change when turn-signal is activated
- Center vehicle between lanes

Automated Map Follower

- Automatically drive given route
- Stop at destination
- Avoid collisions along the way
- Inter-vehicular communication (for Intersections)

Your Impact on the World