



Battelle CyberAuto Challenge

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Battelle



1. Conduct Interesting Research
2. Work for the betterment of humanity
3. Improve the next-generation workforce

Progress of embedded technology in automobiles.



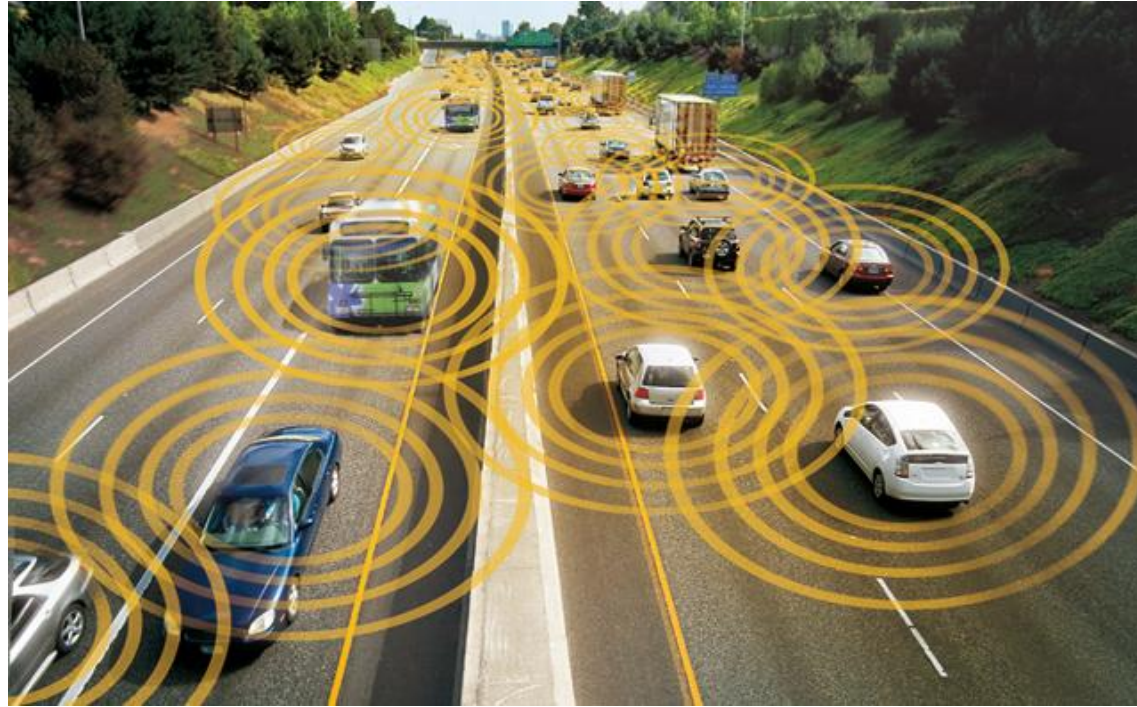
Mechanization
Transportation
Recreation
“Tinkering”

Instrumentation
Multi-function (office,
hotel too)
Entertainment
Mobile Enablement
“Engineering”

Computerization
Node-on-the-Network
Mobile Integration (data, context,
preferences – follow me)
Intelligent Adaptation and Safety
V2X (V2V & V2I)
Extension of SmartPhones (?)
Feature Exploitation
“Cyber”

Connections

- Cellular
- WIFI (802.11)
- Bluetooth (802.15)
- OnStar (cellular), etc.
- DSRC (pending – modification of 802.11 P)
- NFC (various)
- Radio
- Satellite
- ?? What's next??



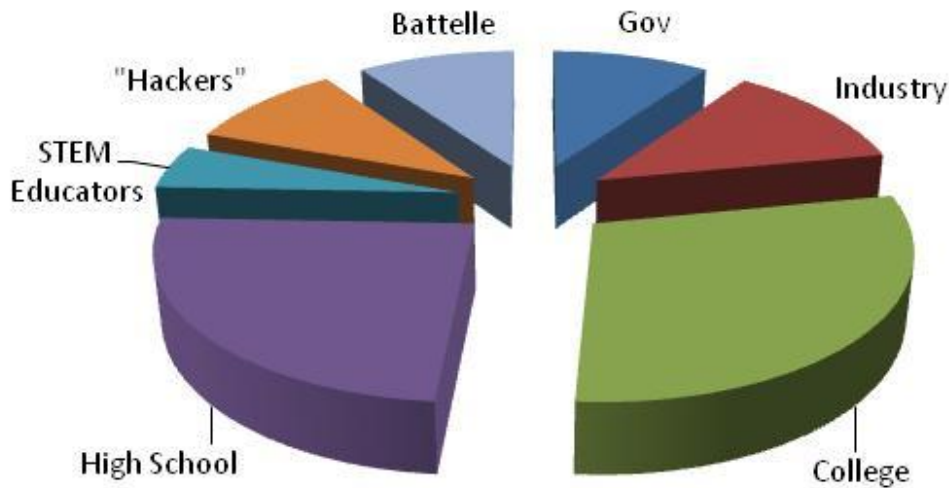
US DOT Image



Toyota concept car:
Fun-Vii

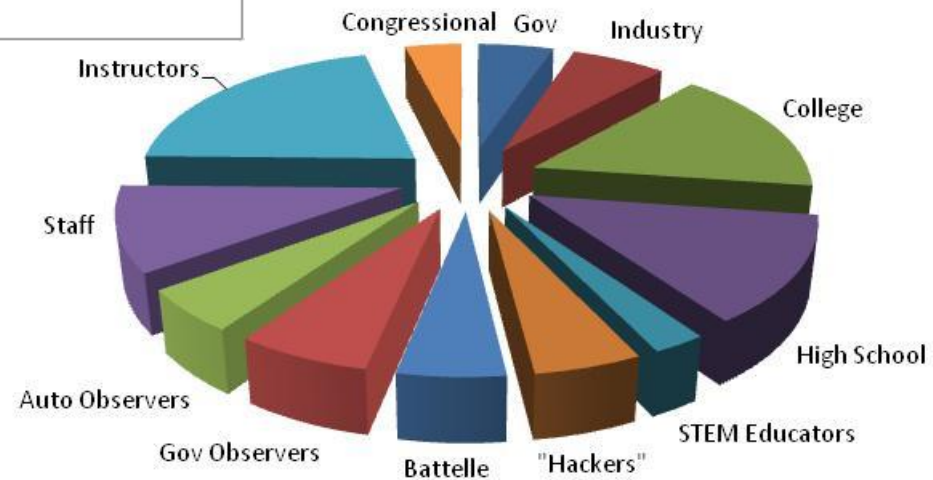
Group Composition

Cohort Composition



- 4 Cohorts
- Integrated teams with representation of each “type” of participant
- Nearly 1-to-1 pairing of College and HS students
- Nearly 1-1 pairing of “Professional” to student

All Participants



- Several Auto manufacturers sent observers – included senior personnel such as directors of security
- DOD and DOT Government observers – hope to have more this year.

Schedule

BEST Center

APG

Battelle Bays

Various

Various

Hour	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday
0400		Sleep				"Hacking Time"
0500		"Available Study or Sleep Time"	"Available Study or Sleep Time"	"Available Study or Sleep Time"	"Available Study or Sleep Time"	"Challenge Problems" - Instructors Available
0600						
0700						
0800		Breakfast				
0900		Intro	CANBUS-2.a	Electronics.a	Forensics.a	Recovery
1000		Legal & Ethics				IP Protection
1100		driving	CANBUS-2.a	Command Center Tour	Car Time	Review
1200		Networks.a				Cycles
1300		Lunch				
1400		Networks.a (cont)	CANBUS-2.b	Resch Cent Tour	Visualization.a	Closing
1500		CANBUS-1.a		Car Time		
1600			Reg Set-up	Driving	Arduino.a	RE.a
1700			Resilient Nets	Driving	Attack Surface.a	
1800		Dinner				
1900		Registration	"mixer"	Offsite	Attack Surface.a	Various
2000			CANBUS-1.a (cont)			
2100			Access Control Devices	Move to BEST & Car Time	Car Time	
2200		Practicum	Movie: Sneakers	S'Mores (opt)	"Challenge"	
2300		driving	Driving		Challenge Problems - Instructors Available	
2400						

Technique: Immersive in Nature



- Maximize group interactions
- Avoid environmental distractions
- Focus on learning
- Focus on collaborative teaching – engagement
- Provide basal instruction – than continuously facilitate
- Hands-on

Why?: stress + fun + interesting problem = camaraderie

Technique: Selection

- Engage schools and Teachers
 - Ask for “good fit” students
 - Motivated
 - Ethical
 - Technical
 - Agree to partner
- “Vet” Students
 - Work ahead materials
 - Multi-discipline
 - Encourage/require interactions
 - Assess and advise
 - Pre-camp sessions engaging
 - Hard subjects
 - Real Problems
- Challenge Students
 - Lab (objective)
 - Resources
 - Full engagement
- Provide Connections
 - Mentors
 - Fellow explorers

Student Feedback

- Shorter assignment periods for work ahead!
- Include quizzes in work ahead (start evaluations)
- Start with a hard problem, then provide help solving (rather than providing the background information first)
- Offer an advanced session next year for “grads”
- Like the immersion

Results

- One manufacturer asked for the student roster and intended to offer internships, two others asked for specific students
- One Gov agency connected with an intern