Driver Interface Research on Augmented Reality HUDs at Michigan

Paul Green

University of Michigan

Panel debate: HUD and Augmented Reality: Is it OK for Automotive?
SID Vehicle Displays 2015
Dearborn, MI
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1. CPS Synergy: Collaborative Research:
   Formal Design of Semi-autonomous Cyber-Physical Transportation Systems

2. I-Corps: Using Augmented Reality for Full-Windshield Displays & Crash Avoidance
Conducted 3 driving simulator experiments

driver responses to AR HUD crash warnings
E1: baseline data (no warning)
E2: AR HUD vs baseline
E3: AR HUD with auditory vs auditory vs baseline
urban world of ~70 intersections

showed benefits (reduced RT), still analyzing

Explored market interest in AR HUDs (I-Corps)
Show video of experiment
The NSF I-Corps project taught us about start ups and discovering customers.

I-Corps: get research ideas into practice

3-person team (team 483, ~ 25 other teams in our cohort
   Prof + (post doc or grad student) + business advisor (start up)
$50K
   0 for PI & business advisor other than travel (but 15hrs/week min)
   covers EL time

3 days of classes on start ups (at Georgia Tech), Steve Blank & business canvas
6 weeks of interviews (goal is >100, we did 96) – customer discovery
   plan on Wed, interview Th & Fri, summarize on Mon, present on Tues
   also materials to read, videos to watch, quizzes each week
2 days for wrap (at Georgia Tech)

Follow up trip to Silicon Valley, provisional patent
The I-Corps and related follow up showed market challenges.

OEMs - huge differences in what they would say, Volvo was most helpful)
Suppliers – generally looking for incentive from OEM
Trucking companies – about 4 or 5 with safety directors are key

Detroit: If it is not going to be produced in 3 years, we bookshelf it.
Let’s see it in a car.

Silicon Valley: Show us your ideas.

Multi-sided development slows implementation display manufacturer
interlayer manufacturer
glass manufacturer
supplier
OEM
What do we need to move forward

Human factors research to demonstrate value (crash, navi, SA)

Human factors research to determine design characteristics
  contrast, % & location of coverage, duration

Design specs for implementation

HF – hardware developer coordination

Research based briefings for the state legislatures (windshield blockage)