Common Misconceptions about Aerospace/DoD/FAA Simulation for Autonomous Vehicles
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In order for autonomous vehicle makers to ever get remotely close to creating this technology and to avoid killing people along the way for nor reason they have to use simulation 99.9% of the time. That simulation needs to use aerospace/DoD/FAA level technology, or they will still come up significantly short. The simulation technology being used aerospace/DoD/FAA is superior to the simulation technology in the autonomous vehicle industry. And there is nowhere it is inferior. That includes real-time capabilities and model fidelity. Those models primarily being the environment, vehicles, sensors etc. And there is no technology this industry does not have that autonomous vehicles need to be developed and tested properly. It just needs to be fully adapted and broadened from the vehicles and urban environments they use now. (In addition, full motion simulators also need to be used to replace real vehicles for core scenarios. The reason for the motion is the need for motion cues. Not only to drive properly but to test properly especially when there is loss of traction and to ensure people will not get sick or feel uncomfortable.)

The reason this matters is that shortfalls of the simulation technology in the autonomous vehicle industry will significantly retard development and testing. Worse yet it will cause massive false confidence that will not be discovered in many cases until real-world analogous scenarios occur, most likely tragedies. For the easy benign scenarios being run now these issues are not a problem. However, as soon as any model, especially the vehicle or tires are pushed or bad weather sets in the generic or poor-quality models this industry uses now, or its slower real-time capabilities start to degrade, that development and testing will falter. Said more concisely, this industries game inspired simulation technology seems real enough – but it isn't.

Yes, I am finally getting to it – the misconceptions

The biggest misconception people in the autonomous vehicle and even automobile industry have about aerospace/DoD/FAA simulation technology is when people think about scenario complexity, they think of air travel. That is not the case. Air travel is structured to be as non-complex as possible. What is as and more complex is DoD simulated urban war games. Not only do they have more entities in some cases, the math models for many of them are more complex, they travel much faster and they run at a faster real-time rate. Remember what the model models is irrelevant. What matters is how complex the model is, how it loads the system and that it can perform in proper real-time.

The next misconception involves what proper real-time is. Most gaming technology do not have proper real-time engines for what is needed here. They do not run fast enough or have the proper timing.

The final misconception is around model fidelity. Specifically, the environment, vehicles and tires. Yes, they look good. But how good are they? Ever seen the performance curves for all of them compared to the real thing? In bad weather? When they are being pushed? Most autonomous vehicle makers don't even use exact car models let alone precise ones in all conditions.

For more on the issues with public shadow driving and how to build this technology correctly please see my article here;

The Crash of the Autonomous Vehicle Industry
https://medium.com/predict/the-crash-of-the-autonomous-vehicle-industry-f71fd26c1ed0