

The Autonomous Vehicle Industry can be Saved by doing the Opposite of what is being done now to create this technology

<https://medium.com/@imispgh/the-autonomous-vehicle-industry-can-be-saved-by-doing-the-opposite-of-what-is-being-done-now-b4e5c6ae9237>

The Autonomous Vehicle Industry can be Saved by doing the Opposite of what is being done now to create this technology

The autonomous vehicle industry is going bankrupt. And has harmed and will harm many more needlessly. This is a self-inflicted wound. And one that is easily cured. At least technically. (Egos are another matter.)

#### The Problem

- Public shadow and safety driving for most development and testing
- Use of Gaming-based Simulation Technology
- Reliance on Deep Learning for object detection and hyper classification
- Bottoms up Agile development
- Hiding Performance and Technical Data as well as avoiding Safety/Testing Standards

#### Symptoms

- Public Shadow and Safety Driving - This approach is wholly untenable. It is a myth that public shadow and safety driving can create a legitimate autonomous vehicle. And the lives the process takes are necessary and for the greater good. It is impossible to drive the trillion miles or spend \$300B to stumble and restumble on all the scenarios necessary to complete the effort. Shadow Driving for gathering data, informing and validated simulation and system intention testing is necessary. The issue is not safety related rather the time and money associated with doing the impossible amount needed to get to L4. Regarding Safety Driving. It is a largely unnecessary and dangerous practice. The process also harms people for no reason. The first safety issue is handover. The time to regain proper situational awareness and do the right thing, especially in time critical scenarios. cannot be provided. Another dangerous area is learning accident scenarios. AV makers will have to run thousands of accident scenarios thousands of times to accomplish this. That will cause thousands of injuries and deaths.
- Deep Learning - It is processor, time and money intensive, and is too easily confused. This makes the process dangerous.
- Gaming-based Simulation Technology – Yes, the visuals look great. But it has too many technical limitations to facilitate the creation of anything close to legitimate real-world digital twin.
- Hiding Performance and Technical Data – Avoiding Safety/Testing Standards – The public doesn't trust you. And right now, they shouldn't. Additionally, models being created need to accurately model their sensor, world, objects counterparts properly. This cannot be done if companies make these black boxes. Not only is there a trust issue but there is a liability issue for them as well.

#### The Cure - Do the Opposite

- Switch most Public Shadow and Safety Driving over to Simulation informed and validated by the real-world.
- Build trust by doing the due diligence and proving it using proper simulation (informed and validated by real-world data). Then you make the case for the migrating to real-world testing. After that you introduce the systems to the public. (Proper simulation being DoD/aerospace

simulation technology, not gaming based simulation. There are far too many architectural and sensor model engineering issues.)

- Use DoD/aerospace simulation and modeling technology to create a legitimate digital twin by resolving real-time latency, loading model timing and active sensor model fidelity issues with gaming-based systems. This will afford the ability to work on end-state scenarios, the most complex and difficult use cases, on day one.
- Use various levels of Dynamic Sense and Avoidance to limit the use of Deep Learning
- Take a top-down Systems Engineering approach. This includes developing and testing to the hardest and most dangerous scenarios now. Something I can now do because I am using the right simulation technology.
- Create minimal Safety and Testing Standards mapped to sceneries and legitimate geofencing. Prove these capabilities using proper simulation first. (The fidelity of the models used in that simulation need to be proven as well). Then move to test tracks and the public domain. Show the public the right progression of due diligence and take them out of the Guinea pig role. This would also increase competition by setting safety bars no one can skip. Thus, ending the race to the safety bottom.

More in my articles here

Proposal for Successfully Creating an Autonomous Ground or Air Vehicle

- <https://medium.com/@imispgh/proposal-for-successfully-creating-an-autonomous-ground-or-air-vehicle-539bb10967b1>

Simulation can create a Complete Digital Twin of the Real World if DoD/Aerospace Technology is used

- <https://medium.com/@imispgh/simulation-can-create-a-complete-digital-twin-of-the-real-world-if-dod-aerospace-technology-is-used-c79a64551647>

Simulation Photorealism is almost Irrelevant for Autonomous Vehicle Development and Testing

- <https://medium.com/@imispgh/simulation-photorealism-is-almost-irrelevant-for-autonomous-vehicle-development-and-testing-136871dee440>

Autonomous Vehicle Industry's Self-Inflicted and Avoidable Collapse – Ongoing Update

- <https://medium.com/@imispgh/i-predicted-this-a-year-and-a-half-ago-1b47bf098b03>

Autonomous Vehicles Need to Have Accidents to Develop this Technology

- <https://medium.com/@imispgh/autonomous-vehicles-need-to-have-accidents-to-develop-this-technology-2cc034abac9b>

Using the Real World is better than Proper Simulation for AV Development — NONSENSE

- <https://medium.com/@imispgh/using-the-real-world-is-better-than-proper-simulation-for-autonomous-vehicle-development-nonsense-90cde4ccc0ce>

Why are Autonomous Vehicle makers using Deep Learning over Dynamic Sense and Avoid with Dynamic Collision Avoidance? Seems very inefficient and needlessly dangerous?

- <https://medium.com/@imispgh/why-are-autonomous-vehicle-makers-using-deep-learning-over-dynamic-sense-and-avoid-with-dynamic-3e386b82495e>

The Hype of Geofencing for Autonomous Vehicles

- <https://medium.com/@imispgh/the-hype-of-geofencing-for-autonomous-vehicles-bd964cb14d16>

Remote Control for Autonomous Vehicles – A far worse idea than the use of Public “Safety” Driving

- <https://medium.com/@imispgh/remote-control-for-autonomous-vehicles-a-far-worse-idea-than-the-use-of-public-shadow-safety-df2ad64772c6>

My name is Michael DeKort - I have worked for Lockheed Martin, the US State Department, The US Navy and in IT. I have worked in aircraft simulation, as the software engineering manager for NORAD, a program manager for the Aegis Weapon System, and as a C4ISR systems engineer for DHS. I am currently involved in autonomous vehicle, smart city and V2X systems engineering and simulation.

Industry Participation – Air and Ground

- Founder SAE On-Road Autonomous Driving Simulation Task Force
- Member SAE ORAD Verification and Validation Task Force
- Member UNECE WP.29 SG2 Virtual Testing
- Stakeholder USDOT VOICES (Virtual Open Innovation Collaborative Environment for Safety)
- Member SAE G-34 / EUROCAE WG-114 Artificial Intelligence in Aviation
- Member CIVATAglobal - Civic Air Transport Association
- Stakeholder for UL4600 - Creating AV Safety Guidelines
- Member of the IEEE Artificial Intelligence & Autonomous Systems Policy Committee
- Presented the IEEE Barus Ethics Award for Post 9/11 DoD/DHS Whistleblowing Efforts

My company is Dactle

We are building an aerospace/DoD/FAA level D, full L4/5 simulation-based testing and AI system with an end-state scenario matrix to address several of the critical issues in the AV/OEM industry I mentioned in my articles below. This includes replacing 99.9% of public shadow and safety driving. As well as dealing with significant real-time, model fidelity and loading/scaling issues caused by using gaming engines and other architectures. (Issues Unity will confirm. We are now working together. We are also working with UAV companies). If not remedied these issues will lead to false confidence and performance differences between what the Plan believes will happen and what actually happens. If someone would like to see a demo or discuss this further please let me know.