

Saving Lives on the Road: How Simulation and Modern Software Tools can Help



When it comes to traffic accidents and saving lives, time is of the essence. While car manufacturers try to build ever safer cars by including sensors, airbags, restraint and braking systems and much more, all of these systems are mainly used to either prevent an accident or to soften and absorb the impact during the crash. Statistics on fatal vehicle accidents show however, that victims most often do not die during or right after the crash occurred, but in the hours and days afterwards. Research shows that up to 44 percent of people who died in car crashes could possibly have been saved if first responders and hospitals had real-time, detailed information about the victim's injuries. As this is far too large a number, the Israeli startup MDGo set out to do something about it by developing a solution that could forever change the way people are treated after an accident.

Better Informed Decisions for Crash Tests as Life Savers

The MDGo team is diverse, comprising of medical advisors, and simulation and software specialists, all working together to contribute their expertise in realizing this challenging project. In the case of an accident, in addition to data available via sensors in modern vehicles, fast and accurate information on its occupants is also needed. With the software developed by MDGo they can provide precisely this kind of information, helping first responders to make the right decision and hence save the lives of many accident victims.

To transform data received from the car sensors into meaningful information about the victim's injuries the MDGo team began applying crash simulation using Altair Radioss™.

"Our core technology is deep learning," said Gilad Avrashi, co-founder and CTO at MDGo. "We started off with real crash tests, not virtual ones – and then trained the model that translates between the vehicle acceleration and the head and pelvis acceleration. As we needed a lot of ground proof results, which we couldn't get from the physical crash test, we turned to simulation and used Radioss to get these."

MDGO
vehicle to medical insights

Industry

Medical

Challenge

Creating a system which automatically alerts first responders and hospitals of accidents, and reports on potential injuries.

Altair Solution

Altair Radioss™ helped MDGo to conduct many crash simulations. By combining these results with actual sensor data from car accidents the system is able to predict potential occupant injuries.

Benefits

Simulation can be handled in less time and at lower costs than physical crash tests. MDGo is able to cover multiple variants of crash configurations leading to more accurate injury predictions, hence saving lives on the road.

To obtain all the necessary data, the team needed many different crash test scenarios. The available physical crash tests were not very diverse, as all crash tests made by automotive OEMs are defined by regulations. While these were a good start for the project, MDGo needed more results to cover all possible scenarios on the road without having to do a large number of expensive physical crash tests – so the MDGo team had to rely on simulation.

More Scenarios in Less Time – Simulation is Key

When looking for a tool that would enable MDGo to generate their own results and still allow more scenarios, MDGo decided on the Altair solutions. "We chose the Altair tools not only because it is a state-of-the-art solution for OEMs but also because the Altair representative in Israel has been, and still is very helpful with our project, which is a major benefit for us," Gilad explained.

Performing crash simulations with the Altair tools, MDGo is creating more and more scenarios, thus making more data available. Also, as the crash tests had to include crash test dummies to explore the impact a crash has on the human body, MDGo uses the Hybrid 3 dummy by Humanetics.

"Bringing in simulation capabilities and having had training on the tools, plus having a person that does the simulation in-house has contributed enormously, especially when it comes to convincing customers. Without simulation, without Altair, we would never be where we are now."

Gilad Avrashi
Co-founder and CTO at MDGo

"The existing physical crash tests helped us to get started, but it was due to the huge impact that simulation has had, that we were able to scale up and get a robust product ready for market. A single crash test would take us at least a month to plan and execute and would cost about 20,000-30,000 dollars. With simulation, this is not needed, and we are able to get our results at a fraction of the costs and a lot faster," explains Gilad. Bringing in simulation has contributed enormously to our successes. Without simulation, without Altair, we would never be where we are now," Gilad explains.

Going to Town – Placing the MDGo Software in Real Life Scenarios

MDGo is currently establishing its system throughout Israel in collaboration with the major EMS (emergency medical service). "Providing the Israeli EMS with information is easy enough. EMS gave us an API and we pop up alerts directly to their system, with an average turnaround time of eight seconds from crash to informing the EMS," explains Gilad. In the past six months, MDGo was able to connect almost 250,000 vehicles in Israel to the EMS, and their system has already reported around 150 validated crashes to the EMS. MDGo is in discussions with several international centers and institutions to explore and find the best way to implement their system in as many countries as possible.

Meeting the Challenge with the Altair Startup Program

One of the many challenges young startups are facing as a big data company, is gathering the data. The MDGo entrepreneurs do not spend most of their time writing the algorithms or the neural network architecture, but in obtaining the data. "We have more challenges in understanding the similarities between cars because we would not like to develop dedicated models for each vehicle, but rather group them in order to save efforts in having more and more simulations," Gilad explains.

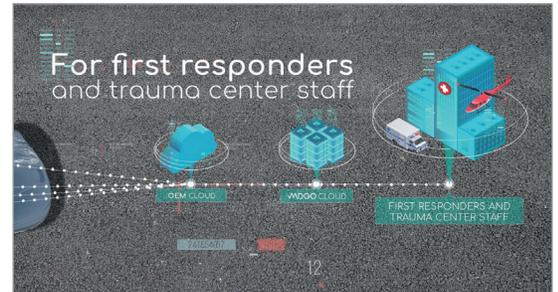
Being a startup, MDGo has a limited budget which makes it difficult to buy professional simulation software. For this young company, the Altair Startup program was a major help, offering access to all kinds of simulation tools, IoT, and HPC solutions, including training and support at an affordable price. And in the case of MDGo, the program also played a part in developing world-class software that is saving lives.



First responders need fast information to make life-saving decisions



MDGo provides real-time information



MDGo provides the EMS with important information on the victim



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