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#GTC23 Round-up - NVIDIA Omniverse, Car ChatGPT, Virtual Factories, Supercar VR & Autonomous Interactions

Lynn Walford - Mar 27 2023



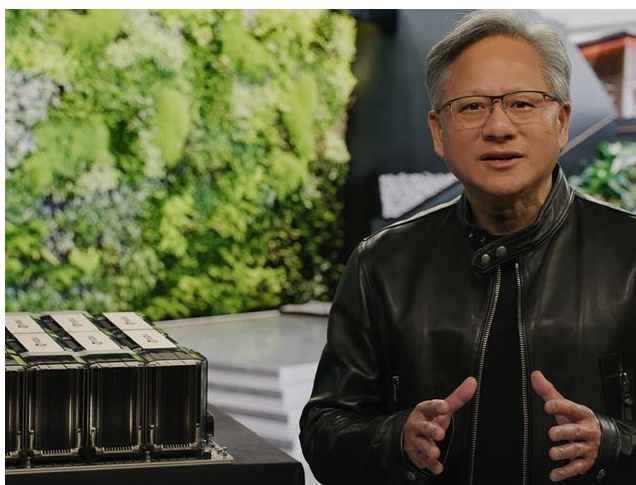
NVIDIA GTC 2023 showcased, enhanced and introduced NVIDIA automotive technology. Keynotes, videos and panels explored future automotive applications and issues. Omniverse Cloud, ChatGPT-style Language Learning Models, talking to cars, subscriptions, autonomous safety myths, autonomous race car driving and NVIDIA for super realistic supercar animation were all discussed.

Jensen Huang Keynote

NVIDIA GTC has grown exponentially. CEO Jensen Huang's keynote address gave an overview of new products and NVIDIA's automotive prowess. Four years ago, the in-person GTC conference had 8,000 attendees. 250,000 people are attending the event this year, reported Huang.

"The purpose of GTC is to inspire the world on the art of the possibility of accelerated computing and to celebrate the achievements of the scientists and researchers that use it," says Huang

He credited NVIDIA tech and processors for the most famous deep learning language platform - ChatGPT from Open AI. He says: "ChatGPT is a computer that not only runs software but writes software."



Automotive Omniverse from Factory to Cloud

are evaluating Omniverse in their workflows, says Huang. Volvo cars and GM use Omniverse and USD Composer to connect and unify their asset pipelines. In engineering and simulation, they visualize power, flow and aerodynamics in Omniverse.

For next-generation Mercedes Benz and Jaguar Land Rover vehicles, engineers use Drive SIM in Omniverse to generate synthetic data to train AI models, validate the active safety system against the virtual NCAP test and simulate real driving scenarios. Omniverse generative AI reconstructs previously driven routes into 3D, so past experiences can be reenacted or modified.

Mercedes Benz uses Omniverse to build, optimize and plan assembly lines for new models. Rimac and Lucid Motors use Omniverse to make digital stores from actual design data that faithfully represent their cars.

Huang reported that BMW is using Omniverse to plan operations across factories worldwide, then joined a virtual session to show the Omniverse-rendered BMW factory. He introduced new systems designed to run Omniverse. NVIDIA is launching a new generation of workstations powered by NVIDIA Ada RTX GPUs and new Intel CPUs.

Omniverse is leaping to the cloud-hosted in Azure. "We partnered with Microsoft to bring NVIDIA Omniverse cloud, a fully managed cloud service," says Huang.

Huang also introduced NVIDIA AI Foundations cloud service NVIDIA Nemo for creating Language Learning Models (LLMs) and generative AI trained from proprietary data.



JLR Creates Luxury Chat

LLM and Natural Language Processing (NLP) are helping Jaguar Land Rover create a luxury chat experience with drivers.

Elizabeth Metcalfe-Williams, Product Owner/Senior Data Scientist, Jaguar Land Rover, and other JLR staff showed how the company developed ways to answer the question, "The road to my chalet is covered in deep soft snow; which driving mode should I select on Pivi Pro for my Land Rover Defender?".

First, they deployed two different models: BERT and CAR BERT. They then used NVIDIA NEMO GPT for Generative Pre-Trained Transformers (GPTs).

GPTs were designed to generate the correct answer based on the fact 'soft snow is like sand' in how the Defender handles it.

The correct answer is, 'Select the sand driving program when driving on terrain that is predominantly soft, for example, dry sand, deep gravel or deep unpacked snow'.

"Modern GPTs are extremely functional testing tasks, reducing the time involved in the data collection level and speeding up to production," says Metcalfe-Williams.



Talking About Cars Talking to You, Subscribing And Safety

Panellists also discussed the future of autonomous vehicles and services and how consumers will interact with them.

"Once you get used to talking to your car and it actually understands you- you wonder how on earth we were trying to type stuff in the past. So I think we will see more and more of that," says Ödgård Andersson, CEO of Zenseact.

"I think a lot of people are going to love it when we actually get to talk to our cars. And that is definitely one of the main things that we have to do and accelerate more, said Annie Lien, Deputy CEO, VinAi.

She also notes that subscription-based services will be accepted in the future.

"Maybe our older generation customers might be a little bit sceptical. They do not really understand the concept of subscriptions for a car and rightly so. But the newer generations definitely somewhat expect they have to pay for a subscription in some way, in everything they buy. So in general, subscription models are going to be a lot more accepted by new customers, and younger generations. Another way of selling subscriptions is the fact that we have so much software, and just like anything in software, you're going to have to make upgrades, no matter what," predicts Lien.

Safety is at the core of all autonomous research at Zenseact.

"There is a lot to be done for road safety. And I think we have the tools in our hands. We just need to be really productive for this and get economies of scale," says Andersson.



Busting Autonomous Myths

Not only is autonomous driving about the technology but about other road users and regulations.

"One myth, I think that would be beneficial to bust would be that autonomous vehicles are going to eliminate all crashes. And, you know, that is certainly not the case. There will still be crashes with autonomous vehicles," says Bernard Soriano PhD, Deputy Director of the California Department of Motor Vehicles

He also notes that a problem with autonomous vehicles is how human drivers react to behaviour different from human drivers.

The interaction between drivers as well as other road users is something that really needs to be looked at as the technology rolls up. There is a multitude of different issues that need to be figured out as the technology moves forward, he adds.

"42,950 lives were lost on our roadways. That is why we are all working on this. We want to make our transportation system safe, as safe as possible. Autonomous vehicles are going to be a piece of that. I would say that it is not easy - this is hard. The technology itself is hard. But as we talked about earlier, everything outside of technology, the road users, the operational aspects and everything besides the technology is also hard. And that makes it exciting for all of us to be working in this space and playing a part in and seeing this technology and transportation involved," says Soriano.



AI Technology Can Train And Beat Human Professional Race Drivers

Sacha Vrazic, Director of Autonomous Driving R&D, Rimac Technology, explains how the company uses NVIDIA DRIVE-enabled autonomous race cars and trains people to drive like race drivers with Rimac Driver Coach.

Vrazic reports the car drives and explains everything that is happening. It is more engaging than just coaching. It also accelerates skill learning. The feedback and visuals are intuitive and are delivered in real-time based on driver performance.

When asked if it is safe to turn any driver into a race car driver, Vrazic answers: "The risks are drastically minimized when you have a system that monitors the driver and overtakes control if needed."

Five professional race drivers and the Rimac autonomous driver were tracked at the same race track for five runs around the track. Brakes and tires were changed

between runs. The autonomous driver came in second.

Super Realistic Rendering for Animated Supercar

Ian Briggs, Co-Founder and Design Director of Briggs Automotive Company (BAC) showed how the renderings of the BAC Mono custom supercar are improved with NVIDIA technologies. The one-seat Mono cars that start at \$300,000 US are custom-made. The beanbag-like seat and the steering wheel are made to fit the driver. Each unique car is designed for each customer.

Through a partnership with Z by HP and NVIDIA, Briggs says renderings improved.

NVIDIA tech-enabled ray tracing produced much higher quality images - in the way that matte finishes and gloss finishes interact with each other and how tone reflects off the other and the contrast achieved. Faster computing also enables animation.

"So our plan now that we have these new [HP Z NVIDIA] machines is that the customer will now get instead of still images - animations," says Briggs.

"This has transformed the customer experience in my opinion. We have been able to do things that were not possible," he adds.

"Once signed off the design to see it in all its glory and as realistic as possible—I think they will see a lot of added value in that. It does not require any imagination anymore about how the car is really going to look."

In the future, when a Mono customer comes to the studio for a seat and steering wheel fitting, he can experience the car in a new way.

"We can present his car in 3D in a virtual world in the design space. A project we are working on, currently, will eventually mean that it will also be possible using VR that he can actually visualize his own car, in his own driveway," explains Briggs.



Vast Knowledge Base to View

During the four days of GTC, there were over seven hundred presentations and seminars. Many technical seminars can still be accessed until 10 April. Some symposiums reveal how NVIDIA platforms and systems could prove valuable in future autonomous scenarios and simulation techniques.

NVIDIA also reported about \$11 billion in automotive orders through 2030.

"I thank our systems, cloud and software partners, researchers, scientists, and especially our amazing employees who are building the NVIDIA accelerated computing ecosystem. Together - we are helping the world do the impossible," Huang concludes in his keynote.

Tags

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