AV19 | Autonomous Vehicles
SILICON VALLEY

A CONVERSATION WITH

Dr. Joe Xing, Director of Artificial Intelligence for AV, Borgward R&D

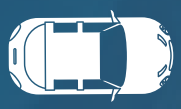
Behavior Learning & Artificial Intelligence in Self-Driving Cars

FORWARD

Ahead of **Autonomous Vehicles Silicon Valley**, taking place this February 25-27 in Silicon Valley, we sat down with Dr. Joe Xing, Director of Artificial Intelligence for AV at Borgward R&D, to learn more about behavior learning and their AI safety platform for self-driving cars.

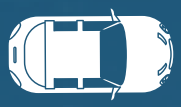
Dr. Joe Xing is the Director of Artificial Intelligence for autonomous driving at Borgward R&D Silicon Valley, where he is in charge of the R&D on artificial intelligence for self-driving car technologies. Dr. Xing is an exceptional scientist, and AI researcher and an experimentalist who always believe in data and experimental results. Previously, he was an engineering physicist and staff scientist at Stanford, where he worked at the SLAC National Accelerator Laboratory developing and managing an in-house software system for data analysis, machine learning, sensor and detector read-out, and big data, and a staff data scientist at NIO USA, where he focused on developing state-of-the-art deep learning and reinforcement learning algorithms for autonomous driving vehicles.

Joe Xing
Director of Artificial Intelligence for AV
Borgward R&D



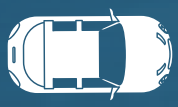
How could Borgward's AI platform potentially transform autonomous driving as a whole?

Our AI safety platform aims to standardize the procedures of testing, validation, and most importantly the commercialization safety standards globally for all autonomous driving cars. Our AI platform will also help to reduce overall the development cycle and cost for collision avoidance tests for self-driving cars as a whole, by utilizing the algorithm to accelerate various risky behavior generations, collision events generation, during a typical collision avoidance test scenario.



What advice would you offer to fellow automakers who rely too heavily on sensors and field testing?

Our general advice is that: field testing is essential and perhaps the “final" step before commercialization of the product, while we have to keep in mind that real-world data collection is costly and difficult to scale up especially for so called “long-tail” events or rare events. Human uncertainties makes the field testing process extremely hard. There are ways that we can actually resort to software or algorithms to help us to reduce or alleviate the difficulties by modeling the human uncertainties, behaviors, thus generates much more scalable testing, experimentation platforms even before the “final” step comes.



How can self-driving cars most accurately predict human uncertainty on the road?

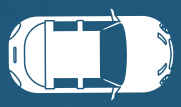
There are mainly two folds on the high level we can pursue in order to study and predict human uncertainties. We can utilize modelings, statistics, as well as what we call behavior physics, to generate a large coverage of behavior database. With the sufficient computing power nowadays, we can utilize these super-coverage of uncertainties distributions to train our computer, and let them learn and get equipped with reasoning and prediction skills just like humans do.

DR. XING'S HIGHLIGHTED SESSION:

MAIN CONFERENCE DAY ONE | TUESDAY, FEBRUARY 26, 2019

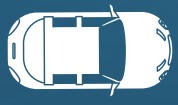
BEHAVIOR LEARNING AND SAFETY PLATFORM FOR SELF-DRIVING CARS

- Systematic methodologies to build and train an AI safety platform dedicated for self-driving vehicles
- The AI platform enables behavior learning from real-world human driver, human road agents’ behaviors, and thus generates so called long-tail events, risky behaviors, and collisions in a scalable manner.
- Prediction of human uncertainty, human intentions, and rationalizing human behaviors on the road



Tentatively, what are your key objectives/priorities for the next 2-5 years?

Our key priorities comes in two folds. Since we already have production vehicles, more than 100,000 units in the market, we would like to incrementally deploy some of the prediction, safety alarming related features as products into the commercialized vehicles, this is to not only increase the user experience in terms of safety but also helps to collect data and improve the whole theoretical framework in real-life data. The second fold is we would like to standardize the whole testing, validation and most importantly the collision avoidance testing procedures for the whole self-driving domain, with a uniform standard and platform to help everyone to reduce their development cycle hopefully.



As a speaker at the upcoming Autonomous Vehicles Summit, what is one message you hope attendees will take away from your presentation?

I would hope we are on the same page of the current status of self-driving car technology in the sense that safety is the main issue, or even could be a "show-stopper" for commercializing the self-driving cars at the moment. Human uncertainties on the road plays a huge role in making the safety difficult to be assured for self-driving cars. We should put more effort into standardization of the safety tests, collision aversion scoring and evaluation procedures for all AD companies, leveraging the algorithm to form a well established, systematic, approach for the uniform safety protocols for every single self-driving car.

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Autonomous Vehicles Silicon Valley brings together the biggest and brightest minds in the tech and automotive space to engage on the future of mobility as we know it.

With clear questions regarding advancements in autonomous technology, public policy and regulations, consumer acceptance, user experience, system design, talent acquisition and of course commercialization, the gathering provides a special forum that enables attendees to benchmark and better their offerings as the race to autonomy truly heats up!

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