

Women In Automotive Interview Series

Part of Informa Tech Automotive Group's Summer Festival of Automotive.

In partnership with:



Meet Shilpa Gulati, Head of Behavior Prediction, Waymo

1. Why did you get involved in automotive?

As a teenager, I enjoyed reading science fiction books and was fascinated by the idea of intelligent robots. I started getting more and more interested in the technical complexities and ethical issues in building artificially intelligent robots that could improve human wellbeing. Encouraged by my family to follow my natural curiosity, I pursued a degree in Mechanical Engineering and then continued my education in Robotics with a Ph.D. program where I worked on an intelligent wheelchair for people with disabilities.



When I graduated, the Google self-driving car project was well under way and the potential for fully driverless vehicles to have a positive impact on people's everyday lives was starting to be recognized. With its potential to make roads safer and save many lives, autonomous driving seemed like the best place for me to apply my knowledge and contribute to something really meaningful. I joined the highly automated driving group at the Bosch Research and Technology Center in Palo Alto. There, I acquired valuable knowledge of the automotive industry, safety standards, regulatory issues, and verification & validation. I then moved on to leading a team at the Apple Special Projects Group in autonomous systems and then at Nuro, where I worked on autonomous delivery vehicles. I then went to the Google project where much of it started. By this time, the project had spun off to be its own independent self-driving technology company - Waymo - and had already begun testing its self-driving vehicles on public roads.

2. What are you most excited about that you are working on right now?

I currently lead the Behavior Prediction team at Waymo, which is responsible for predicting future actions of other traffic participants, such as other vehicles, cyclists and pedestrians. This is one of the key technologies comprising the "brain" of a self-driving vehicle. Behavior prediction is technically a challenging problem. We need to predict, with reasonable accuracy, intentions of a large variety of traffic participants, dealing with complexities of partial information (e.g. a car occluded by other vehicles or behind vegetation) and ambiguities in inferring the intent of human drivers (e.g. a car having a left turn indicator light on but continuing to drive in lane, a car slowing down and then deciding to run a light just about to turn red, and so on).

At Waymo, we solve the behavior prediction problem by developing algorithms that are informed by and learned from over 20 million self-driven miles on public roads. I am excited about working with a diverse group of incredibly talented people to solve the prediction problem, and to contribute to providing the best possible driving experience in Waymo's autonomous cars.

3. How will your work impact the future of transportation?

Autonomous vehicles can dramatically transform transportation, much like the automobile did in the 20th century. Self-driving technology has the potential to save tens of thousands of lives annually that are lost

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in crashes due to human errors. It can improve mobility for people who are currently unable to drive. Car ownership may dramatically decline in dense urban environments, as people will prefer the convenience of reliable on-demand rides in self-driving vehicles. Autonomous trucks can help deliver goods over large distances and delivery vehicles may bring groceries, food, and other packages to our doorsteps.

4. Why does diversity matter in this field? Anything in particular that you are doing to promote diversity in your company and/or our industry?

I will speak from the perspective of the AV industry whose goal is to make fully self driving cars to serve the broadest possible set of customers. To achieve this goal, we need to solve several highly technical problems and also navigate a myriad of complex challenges to build a successful business. This is only possible by the collective effort of people with a diverse set of backgrounds in sciences, engineering, design, user experience, manufacturing, business development, legal, policy, and many other disciplines.

Furthermore, a key ingredient of any successful business is customer trust. To build customer trust, self-driving cars need to drive naturally and predictably, communicate their intent, be respectful of other traffic participants, and offer a comfortable interior experience. A diverse team can enable us to engineer trust into every step of the process for a diversity of users.

Equity, Inclusion and Diversity (EID) are central to Waymo's mission. EID matters to me because I believe that we build the best products only when we combine multiple perspectives into a holistic view. Along with several colleagues, I have been working to convert EID values into actions that I hope will have a meaningful impact in our organization. In addition, I advise and mentor women who are thinking about getting into robotics and autonomous driving fields, and women who are starting out in their careers.

5. What advice do you have for rising women in this space?

In my experience, there are three key elements that matter in a career journey. First, a realistic understanding of the world and our own capabilities. Second, a vision of our short-term and long-term goals. Third, taking appropriate actions to achieve our goals. In all this, we should aspire to maintain a healthy skepticism about our own beliefs and have the resilience to bounce back from the inevitable mistakes and failures. The AV industry is constantly evolving and so are the outside factors that influence the industry. Therefore, my advice is to continuously and actively learn - figure out what we know less of and seek out resources that help us advance our knowledge. This includes both domain knowledge as well as generalizable knowledge in areas like interpersonal skills, strategic thinking, business, and finance. Breadth enables us to predict a range of possible future outcomes and to create new opportunities at the right time. In addition to acquiring breadth, I also suggest working toward building deep expertise in one key area that plays to our strengths. Depth in a key area provides us a solid foundation to build upon and makes our skills sought after in the industry.

Another aspect of a realistic understanding of the world is acknowledging that while many of us aspire to a world with equal opportunities for all, in reality that's not the case. It is crucial to recognize when we are in a place that doesn't provide us equal opportunities. In this situation, we either try to change the culture by raising our voice and seeking allies or seek opportunities elsewhere. Regarding goals, many of us don't have clarity on our long-term goals in the early stages of our career. In that case, it is best to experiment with working on new and varied projects so we can learn what we like and can also become good at. As we understand better what we want longer-term, we can focus our learning and can explicitly seek advice and mentorship from people who are further ahead along our desired career path.

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Finally, speaking about actions. I alluded to actions earlier to acquire a breadth and depth of knowledge, to take stretch opportunities, and to make new opportunities. Additionally, it is important to be intentional and thoughtful in our actions so that and not just react to situations so that we continue advancing toward our goal. That said, career journeys are rarely straightforward. A combination of our actions and circumstances beyond our control can lead to failures. In case of failures, we should be prepared to do an honest assessment of what went wrong, learn from that and move on.

Thanks, Shilpa for taking the time to talk to us about your experience working in Automotive.

For more insightful intelligence, please visit the [Summer Festival of Automotive](#).