

# Stanford

## Renault-Nissan Head Carlos Ghosn Talks Future of Cars at Stanford

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By Andrew Myers | Stanford Engineering

Research News

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The Car of Tomorrow

Renault-Nissan CEO Ghosn says engineers critical to future of automobile.

To hear Carlos Ghosn tell it, the car of the future will recognize your voice and respond to subtle hand gestures. It will sense when you are falling asleep behind the wheel and it will brake when the car ahead slows unexpectedly. It will know your favorite song and how you like your seat adjusted. In short, your car will know *you*.

"A car is going to be more like a pet than a machine. It is a very special relationship. We want to create emotion around entire the car experience," Ghosn said before a packed house at VAIL Lab for the latest "Open Garage" talk, sponsored by the Center for Automotive Research at Stanford (CARS) and the REVS program at Stanford.

*Carlos Ghosn, head of the Renault-Nissan Alliance, advocates the need for engineers in the automobile industry. (Photo: Steve Castillo)*

The Brazilian-born Ghosn should know a bit about the car of the future. He is CEO of not one but two car companies, France's Renault and Japan's Nissan, makers of the Leaf, the first mass produced all-electric vehicle in the world.

In his talk and in the question-and-answer period that followed, Ghosn waxed poetic about the evolution of cars from utilitarian devices to thinking machines that will keep us safer, make the world a cleaner place and turn the cocoon in which Americans spend an hour or more of each working day into a full-fledged partner in our lives.

To the many students in the audience, he had a clear message: The auto industry needs engineers, badly. "There is no competitor to the car in terms of independent transportation. None. This is the right place to be," Ghosn said. "You can carve out a long career here."

From computer science to electrical engineering, new materials to alternative energy sources, he said, the car is a single place where all of tomorrow's engineering will meet.

"Mapping. Vision. Object recognition. The car is the place where the most advanced engineering will take place," Ghosn added, noting that the auto industry will need to find partners across the spectrum -- from university labs to startups, traditional collaborations to unexpected partnerships like those with NASA and other aerospace companies.

Sizing up the opportunities in the automotive field here at Stanford, CARS executive director Sven Beiker pointed out that few schools can match Stanford's breadth in automotive engineering.

"Silicon Valley is the new Detroit," he said. "There are opportunities in every area of engineering in the car. Stanford is a leader in autonomous cars, safety systems, connectedness, apps, batteries, alternative fuels and more."

These partners, especially university partners like Stanford, Ghosn says, are keys to innovation and speed to market. "Universities are the birthplace of innovation. A startup is much faster to market than a big auto manufacturer," he said.

Given the plethora of new technologies emerging in the industry, Ghosn cautioned against irrational exuberance. "There is a whole Christmas tree of technologies out there that we could put in our cars, but we need to choose those the market wants. By remaining agnostic, we are in a position to pick and choose among the many features," he said.

Pointing to the six million accidents in the United States each year, Ghosn predicted that technology can prevent most of them. Car accidents are the number one cause of death for Americans between four and 34. "Ninety-three percent of those six million accidents are caused by human error," he said. "We can prevent them."

The changes will be many and they will be sweeping. Some will be made possible by advancing technology, others by sheer demographics. "A child born today has a 50 percent chance of living to 100 or more," Ghosn said. The ballooning population of elderly will need transportation. Ghosn foresees a burgeoning market for autonomous cars for the over-80 market in a few years.

Returning to his favorite subject, electronic vehicles, Ghosn predicted that the obstacles now facing that sector will reach a point of convergence where manufacturing scale, cost efficiencies and infrastructure are in place to make a serious dent in today's 80 million unit market for new cars each year. Last year, electric vehicle sold worldwide numbered just 100,000 — about one-tenth of one percent.

"When the price comes down, the battery technology offers improved range and the availability of plug-in stations reaches critical mass, then electronic vehicles will take off," he predicted.

But he argued that government should play a part by providing continued incentives and regulations. "It's the right thing to do for the future," he added.

*Andrew Myers is associate director of communications at the Stanford University School of Engineering.*

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