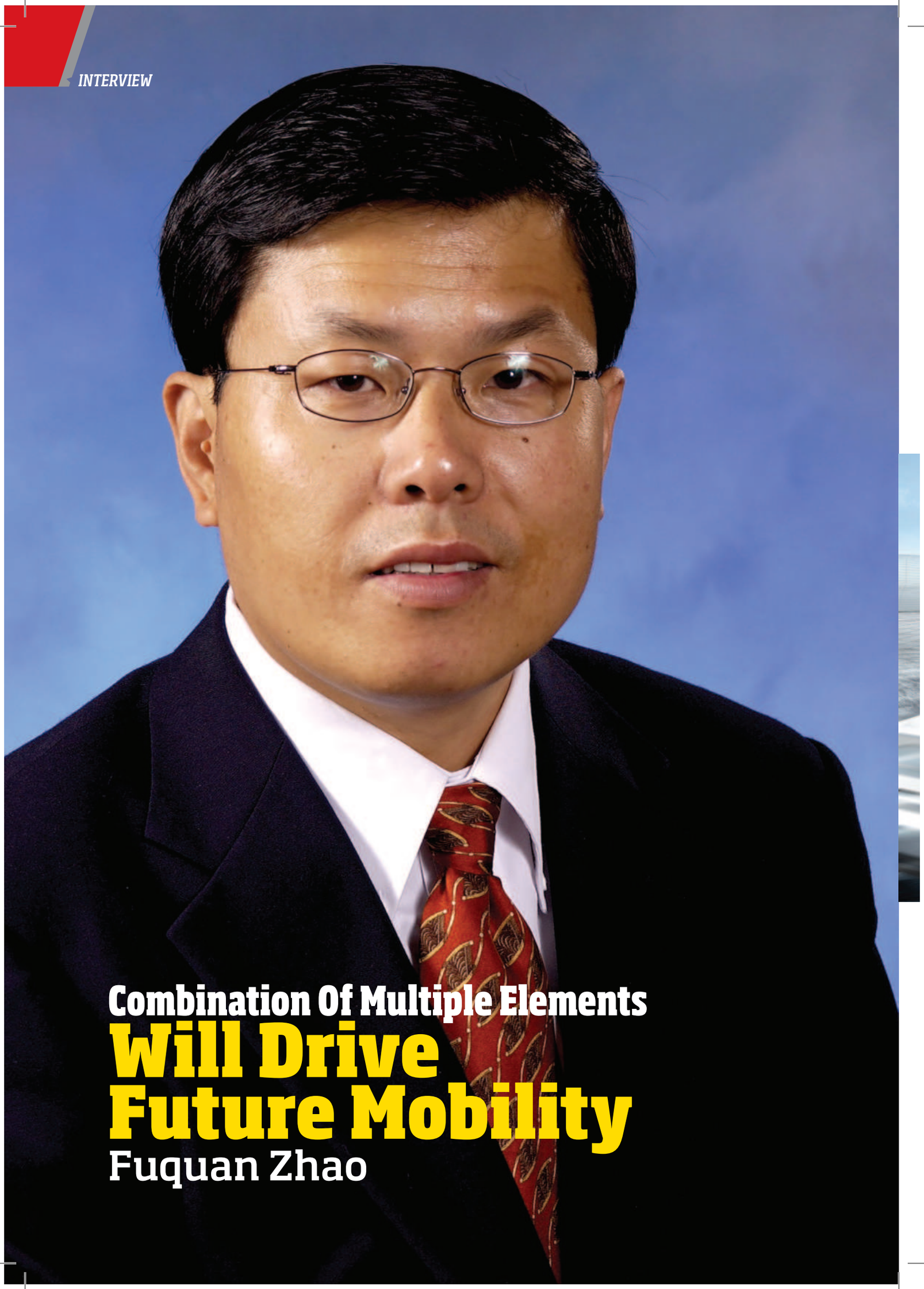


Combination Of Multiple Elements

Will Drive Future Mobility

Fuquan Zhao

FISITA, controlled by the engineering professionals and supported by the automotive industry, is the umbrella organisation of the national automotive societies around the world. Its network of Member Societies represents over 210,000 automotive engineers. FISITA provides a forum for discussion among these engineers, the industry, government, academia, environmental and standards organisations. It organises several events, including the biennial World Automotive Congress, the annual World Automotive Summit, and the annual braking specialist event, EuroBrake.

Recently the World Automotive Congress was held in Chennai, India, for the first time. Prof ***Fuquan (Frank) Zhao***, Director, Tsinghua Automotive Strategy Research Institute (TASRI), and the President of FISITA, spoke to ***T Murrali*** of ***AutoParts Asia***, about the current challenges for the global automotive industry and the way forward for sustainable mobility. "There has to be a combination of regulation, technology and the product fleet of new energy vehicles that consists of EVs, hybrids, plug-ins, fuel cells and others; we cannot have a cookie-cutter approach. From now on it will be multiple elements," he said in an exclusive interview. Edited excerpts:

Q: Congratulations on becoming the President of FISITA. What will be your immediate priority?

A: FISITA is an umbrella society, something like the United Nations for the auto industry. My job here is to focus on the quality and development of FISITA as an international organisation with a 70-year history behind it. How do we make it better? The key is active involvement of all the members in different parts of the world. The other aspect is recognition as members want to be seen as global players; FISITA is the only organisation that has the authorisation to tell them they are part of the global community. We have corporate members and country-society members. So my immediate job will be to make FISITA better by involving more members and recognising their efforts.

Q: What is your view on the recently-concluded FISITA in India?

A: This is my second trip to India where I spent a little more time having broader interactions with Indian engineers and executives present at this event. Seeing is believing, and my first impression is that the level of interest here in the auto industry is higher than I thought, compared with my last visit about eight years ago. The change is even more as I see more cars, bigger and better, which means more opportunities for automobiles in this country. I see many two and three-wheelers, looking for enhanced quality. You may be a little behind China, but it's a great opportunity. The high level of interest and the opportunity are the two factors that have impressed me. I find that the Indian engineers are very interested in talking about technology; the executives and professors here have a very clear view of the industry.

Q: FISITA is also a leading advocate of education of the young engineers. Why, what lacks in them?

A: The automotive is a mechanical-driven industry. The interest in it was more 20 years ago because the automobile was perceived as a mechanical carrier with electronic capability. In this era of cyber and information technology with the internet of everything, the level of interest, especially among the young, is more on electronics, IT and connectivity than in engineering. They see better opportunity to make more money with more investments in such companies. That's why I feel the level of interest in engineering, not just automotive, has come down. Of course older companies evolve as time passes by including newer technologies but society doesn't see it as such. So educating the public is important; hence the need for organisations like FISITA and SAE, to inform the world that the older companies may have a history behind them but they are always ready with new content. They are the real carriers of state-of-the-art technologies and they have done so right from the beginning.

Q: What would be your advice to the young engineers?

A: They have the freedom to choose their own careers. They need to be exposed to, and explore, different things to have better understanding before they sign up for anything. The auto industry is a perfect example of a capital-intensive, mechanical career with new spirit incorporating connectivity and big data; it has everything for the people. Young engineers need to be open to it, experience it and finally decide how they can contribute to society. Mobility is important and automobile is the enabler that does it.

Q: One of the objectives of FISITA is to develop safe, sustainable and affordable mobility solutions, but there is always a trade-off. How do you pursue it?

A: Cost is one thing. We can always be cheaper but at the cost of quality. If you don't have quality you compromise on safety. Good quality costs a fortune; improving it costs money. So, one has to always balance costs and affordability with quality, giving safety high priority. That's the challenge that engineers face. To resolve it they should have the wisdom to combine all the knowledge of design and technology available in the most advantageous way; the auto industry is the only one that embraces all these together. It produces millions of units annually with affordable high quality; that is really the challenge and charm of this business. I would certainly recommend it to the youngsters of today as it is much more difficult to brand a car than a computer; it is something their brilliant minds can work on. This industry covers everything – mechanical methods, electronics, control systems, materials, manufacturing, processes; now Google and Apple also want to enter here. If you see the situation worldwide, if any country wants to develop its industry, automobile is the first choice as any car needs ten thousand different components to be fitted in.

Q: The founding President of FISITA, Maurice Norroy, had said, "The history of the automobile, more than anything else, is the history of a revolution." What kind of revolution do you see in the automotive industry now?

A: If you look at the history of the human being you find three revolutions that changed our life. The first is energy. Watt invented steam power which changed the world, then we

burnt petrol in the car that changed our life. Second is transportation capability; the car and the aeroplane have made distances shorter. The third one is communication; the telephone transformed our lives, now the cell-phone has connected us worldwide. Today, these three things are happening together in the car. We need new energy to reduce carbon emissions to fix problems relating to global warming. This has ushered in a totally different world of the car; the car is no longer a carrier of people from one place to the other. Today, when you sit in the car you are connected to the outside world; soon you won't require a driver to take you around with autonomous vehicles being made. Disruptive technologies will pop up, bringing in a new way of life. In summary, three revolutions are energy, connectivity and artificial intelligence (AI) that are leading to six revolutionary changes in the automotive industry that can be described as: from information silo to intelligent terminal; from human-driven vehicles to autonomous driving; from energy dissipation machine to mobile energy carrier; from own-to-use to car- sharing; from conventional manufacturing to smart manufacturing; from tool for movement to transportation as a service.

Q: With autonomous vehicles gaining significance with every OEM's R&D, what are the challenges you see in the automotive landscape?

A: Autonomous driving is a totally different world. A smart car is not enough. We need to have, a smarter environment with the infrastructure to support it, communication capability, smarter roads and higher standards. Autonomous driving requires three elements to work together: the car manufacturer, information technology and infrastructure. Autonomous driving can be well demonstrated now in dedicated areas but it cannot be available to everyone on the road because a lot of changes are necessary.

The industry is becoming borderless with the need for smart infrastructure and all the high-tech companies involved in the development process.

We need to even change our way of understanding the auto business; if a driverless car is involved in an accident, who will be held responsible; what will be the legal issues to be considered. It's a new world out there and the old understanding of many issues is not enough anymore; they have become complicated and require more knowledge and better understanding. The industry will have to work together to make autonomous driving happen.

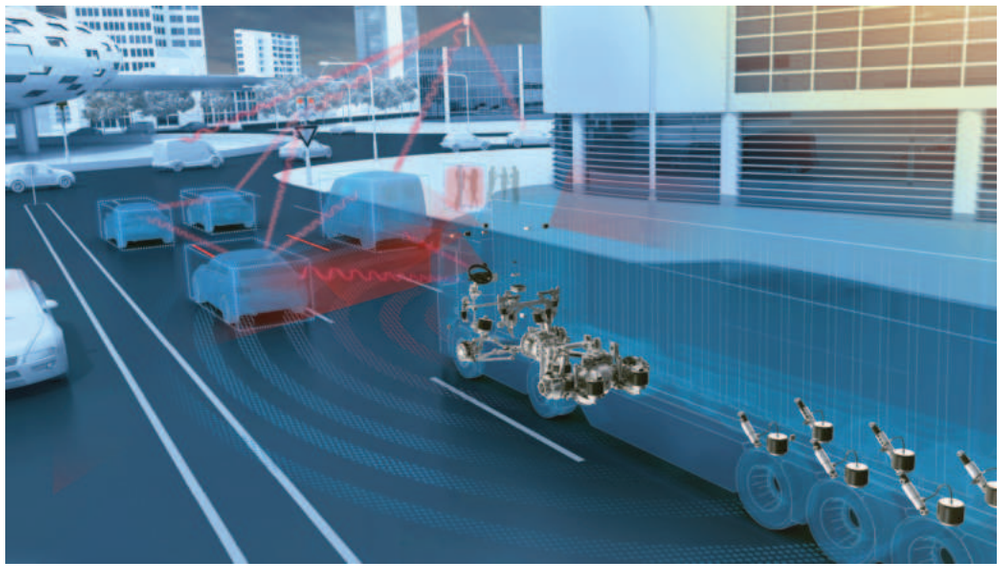
Q: With ride sharing picking up, do you think there will be a fall in car production? In some countries, there is a drop in the number of people getting their driving licenses.

A: Sharing of vehicles is the future of business development. It's not just in the auto business but it's going to happen everywhere in our society. Sharing allows people to get access to many things they want. Sharing will become the economic outlook of the future; now we have the technology to get there. Sharing of vehicles is a difficult proposition; it is an expensive and movable device that is difficult to manage, but to my understanding, it will be the future. There's a long way to go. Our study shows that in the beginning sharing would be popular but in due course of time people would still want to own vehicles. As the sharing concept catches on, volumes would rise. How quickly it happens would depend on governmental effort and the business model to be followed. The future would see a better vehicle utilisation rate; depending on the country and population density, it could vary. Vehicle volumes may not go down drastically because the utilisation rate will be higher and cars would 'retire' earlier.

Q: What is your view on the issues with emission and fossil fuels?

A: Emissions mean hydrocarbons, NOX, particulates, etc. This is the traditional understanding of emissions from internal combustion engines that burn fossil fuels. With global warming increasing there is a new definition on emissions – CO2 is now part of it considering the environment and climate level. The world is walking away from fossil fuels, not because it's not manageable. State-of-the-art technologies of today make it all much cleaner; emissions from the tailpipe could be cleaner than the air in the

atmosphere. One of the problems with fossil fuels is that they give out large amounts of carbon dioxide which is a major contributor to global warming; of course there is a debate that it is the major defaulter. However, global warming is certainly going to be a major threat to the human race; obviously, we cannot disregard any potential threat. All countries have reached a common agreement in Paris in 2015 to tackle this. By the end of this century if the temperature increases by two degrees Centigrade than pre-industry level, then half the world would disappear as it will go below sea level. So we should all work together to minimise the risk. Renewable sources of energy (solar, wind and hydro) and electricity from nuclear power is what we should look at.



Q: Do you hear the death knell of the IC engines?

A: IC engines are part of our world today regulated by CAFE to ensure that the carbon dioxide produced by them is under control. One can't easily walk away from fossil fuels as that would considerably affect energy levels; you would need to change your whole infrastructure. Cutting fossil fuel usage means an impact on economic growth, by GDP. It is going to be a long walk before we can replace IC engines completely by other technologies. But we need to be prepared.

Q: The world over, OEMs, and to some extent Tier-1s, are working on certain technologies without knowing the final destination; it could be on EVs, Hybrids and Fuel Cell vehicles. So from FISITA's point of view, how do you educate professionals working with vehicle makers and Tier-1s about the right direction to take?

A: We have to agree with the tougher regulations and on the availability and the use of fossil fuels. We need to cut down usage especially from the perspective of climate change. We have to see what works best for the future whether it's EVs, hybrids or vehicles using traditional fuels. We need to know how to store energy and how to supply it correctly. We are entering a new era that will have multiple choices of power plants. Nobody has a clear direction as yet, given the fact there is no single solution to this. We are entering a multi-choice generation where we will have to discern the right revolutionary changes to go forward. Countries and companies will have to choose for themselves; they will have to challenge themselves as to where they are heading and what they have in hand to get them there. It's a real challenge for the decision-makers – you need to know the business and which market you are heading to. For example, China has to meet CAFE directives for fuel economy; from 2019 there are also mandatory guidelines for EVs. It has to be a combination of regulation, technology and the product fleet of new energy vehicles that consists of EVs, hybrids, plug-ins, fuel cells and others; you cannot have a cookie-cutter approach. From now on it will be multiple elements.

Q: Do you think India can organise Euro-Brake, the world's largest braking technology conference and exhibition?

A: I don't think Euro-Brake can be organised in India, but FISITA can have other seminars here with local participation. If we get a proposal from India that is mutually beneficial we can go ahead; for example, it could be something on Indian brakes, vehicles or ICT.

Q: FISITA and Institute of Motor Industry (IMI) have collaborated to form a strategic Partnership to promote new skills and standards among the global industry. It also has partnership with CLEPA. Do you see scope for similar initiatives with other countries including India?

A: FISITA welcomes other member societies to join it especially now that the automobile industry is moving towards e-mobility. We have some strategic partnerships with other societies. I don't see any conflict of interest in teaming up with organisations in India. We encourage this as it would make Indian industry more global and in return bring in talent and technology into the country. APA

NB: Vehicle photos are representational.