

An Exciting Future Awaits us in Automotive Engineering Technologies

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It is with great pleasure to write this editorial for the inaugural issue of *Advances in Automotive Engineering*. The exciting developments in automotive engineering and technologies make this opportunity so much more special. It is quite befitting of this excellent journal that its launch coincides with one of the most exciting times we have experienced throughout the automotive history, when it comes to technological advances and engineering achievements.

It worth noting that many of the technologies that we currently enjoy in our vehicle—and, for the most part take for granted—were introduced many years ago, some as a point of curiosity and some driven by the OEMs marketing departments. When GM introduced its automatic transmission in 1940, it was called Hydra-Matic Drive, carried a \$57 price tag (a lot of money back then!), and served as a neat gadget that differentiated one's car from all the others in the parking lot, rather than the absolutely necessary equipment (just ask my wife!) that it is today. The same is true of power steering that we enjoy in our vehicles. First implemented in modern automobiles in 1951 by Chrysler, the early power steering systems were another neat option than an absolute necessity.

I am confident that the history will repeat itself. The technologies that we are working on in our laboratories for their wow factor and intellectual challenge will become the absolutely-must-have-it devices in our future vehicles.

My excitement about our future vehicles stems from the exciting technologies that we are working on in our laboratories, today. I cannot resist but to name some of these incredible technologies, even though I know that I will undoubtedly leave out many others. What stands in the horizon, some immediate and some far, for our future vehicles include:

Night vision technologies that enable us to see better at night: This is particularly important with the aging population, globally. Remember that the first one of our senses that diminishes with aging is our night vision.

Rear-mounted cameras that help with backing up and detecting objects behind us: Currently available in many new production vehicles, cameras are expected to become an integral safety device in our future vehicles, well beyond just helping us with better seeing what's behind us when we backup. The race is on among the car manufacturers to see who can introduce the most number of cameras in their production automobiles!

Vehicle-to-vehicle (V2V) and Vehicle-to-infrastructure (V2I) systems that allows our vehicles (and us) know what others around us on the road are doing: There are multitudes of research programs in the U.S., Europe, and other places around the world (under various acronyms that resemble an alphabet soup) that all aim at bringing "smarts" to our cars and the road. The common factors among all of these programs are novel sensory technologies and short-range wireless communication that enables vehicles on the road to communicate with each other and the road. The information exchange allows us to more harmoniously manage the vehicles on the road, including safer spacing and speed control for collision avoidance and safer driving. Now, just imagine your vehicle being able to tell you—or automatically take action—to reduce your speed to enable you to more safely cross a bridge ahead with frozen road surface. Or, your vehicle being able to let the vehicle behind you know that its high beam is blinding you and it better

switch to low beam, or yet better take action and switch the headlights to low beam.

On-board internet systems that allow us uninterrupted connectivity: Although some argue the necessity and utility of such a technology, it enables some who spend extended length of time in their cars as part of their profession to have their vehicle available as an extension of their office. Now a contractor or sales person can process much of her/his paperwork while waiting for a next appointment or during the down time while parked in place. It can also bring us GPS and other means of locating the vehicle in times of emergency or for possibly monitoring the whereabouts of our young drivers when they are out with the family car.

Multimodal personal transit concepts that allow a modular utility of our vehicles: There has always been a fascination with multimodal transportation systems that can shrink or expand in a modular fashion for equally accommodating our varying transportation needs from driving the work alone to taking the whole family out on a vacation. We are now embarking—at least on the drawing board—on feasible engineering concepts that can travel on the road (much the same as our current automobiles) or change form and move on elevated monorails that can be constructed in highway medians or other suitable places. While moving on the monorail, the vehicle is guided automatically with no or minimal need for driver interaction, leaving us with time to cruise on our PDAs without risking accidents. (Now, that's what gets most modern-day drivers excited!) The vehicle can take a modular form that can expand or contract much in the same manner a train can. More excitingly, the automated transportation concept can be extended to carrying cargo. In slow times, such as at night, the monorail can be used for cargo transporters in an automated manner, enabling efficient intercity cargo transportation and nearly uniform utilization of the infrastructure.

A pipedream? I contend not! Just like many technologies that have come before them, the above technologies will become commonplace in the cars that our kids, grandkids, or we will drive in the future.

I am fully aware that I have left out many other exciting technologies, including some that you may be working on in your labs. On behalf of the editorial board of *Advances in Automotive Engineering*, I would like to invite you to send us your research articles for publication consideration in this journal. Such publications will allow for more efficient and effective dissemination of information, ultimately helping with advancing the state of the art. In keeping up with the digital age that live in, *Advances in Automotive Engineering* is published as an "Open Publication Journal," in which the articles are published online in an unrestricted manner for the use and downloading by all.

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