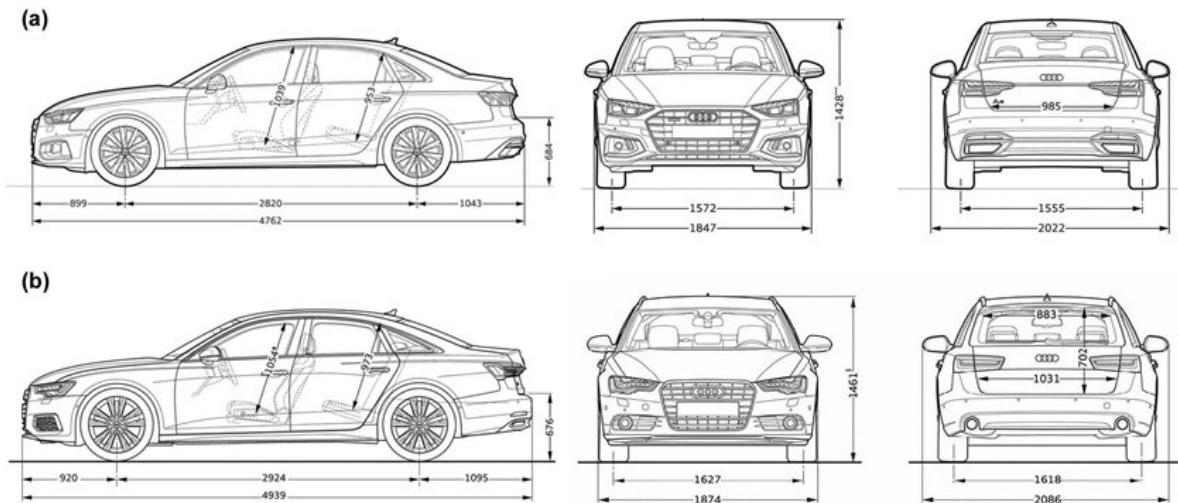


Empirical automobile class sizes

July 20 2021, by Rainer Klose



Find the difference: Audi A4 mid-size car (upper panel) and Audi A6 upper class sedan. Credit: Audi AG

Traditionally, passenger cars are classified by experts in each country into categories such as micro, small, middle, upper middle, large and luxury class. But this old fashioned method has limitations in terms of compatibility. Moreover, some crossover vehicles are difficult to categorize. Empa scientists found a method to do this sorting fairly and in an efficient way by browsing databases with machine learning methods.

In order to correctly separate vehicles into [classes](#), for instance for mobility pricing, one must be able to clearly distinguish mid-sized cars from upper class cars or [small cars](#) from compact cars. But this is becoming increasingly difficult: On [photos](#), an Audi A4 looks almost the same as an Audi A6, a Mini One looks similar to a Mini Countryman. To date, there is no independent procedure for doing this.

Thus far, the classes in each country have been determined by experts—to a large extent at their own discretion. Empa researcher Naghmeh Niroomand has now developed a system that can classify cars worldwide based on their dimensions. Purely mathematical and fair. Thanks to it, the current classification by experts could soon be a thing of the past. At the same time, car classes could be compared worldwide in an easier and more objective way. After all, a 'mid-size car' is something different in Italy than it is in the US.

More information: N. Niroomand et al, Robust Vehicle Classification Based on Deep Features Learning, *IEEE Access* (2021). [DOI: 10.1109/ACCESS.2021.3094366](#).

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