

Big Data Workshop – April 27th 2016 – Politecnico di Torino

100 SENSORS, 1 MILLION VEHICLES, BIG DATA REVOLUTION IN AUTOMOTIVE

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GENERAL MOTORS

VEHICLE COMPLEXITY

§ An ECM has 2M code lines & +3k functions

Complexity of software in Mio of lines of code



THE VEHICLE EVOLUTION

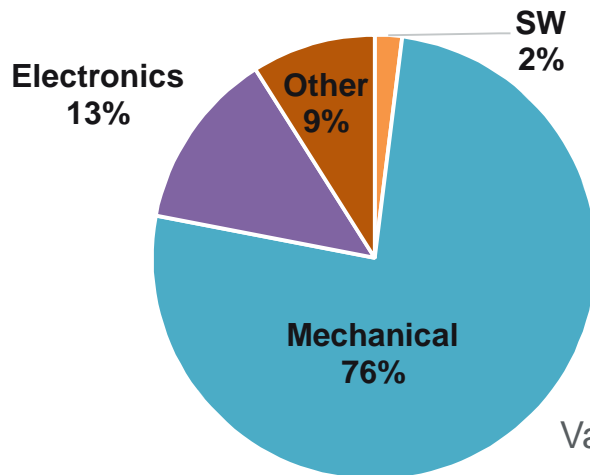


\$ 400
20 ECMs, 1M code lines

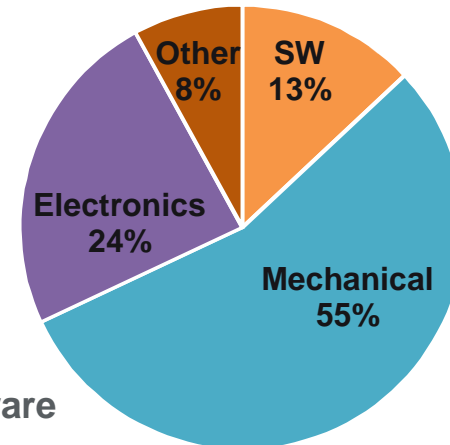


\$ 1.200
75 ECMs, 100M code lines
+50 sensors/actuators

Connectivity

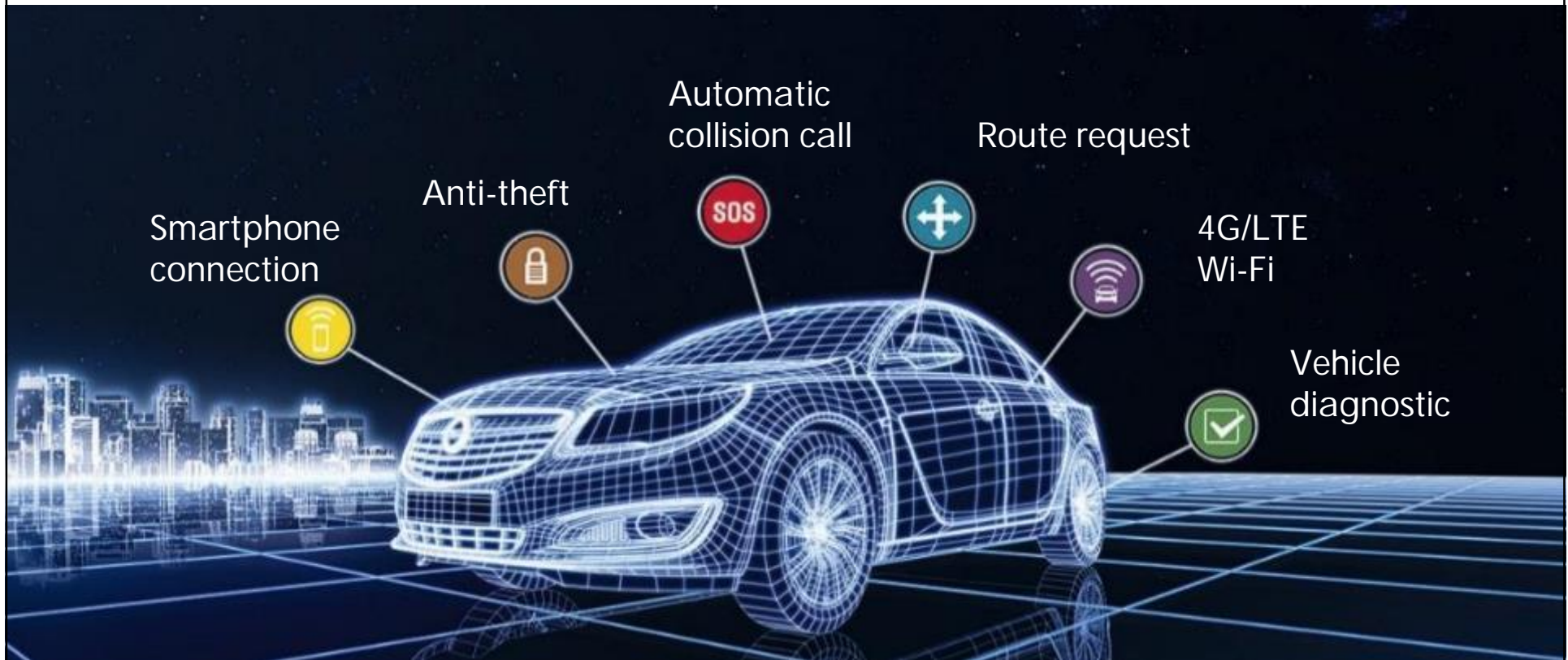


Value of **electronics** and **software**



ONSTAR TECHNOLOGY

§ The keyword is Connectivity



§ The task is Data Collection

DATA COLLECTION, A GAME CHANGER

The vehicle change from a simple transportation means...



...to a technological platform that integrates products and services



Propulsion



Connectivity



Services

GENERAL MOTORS

DATA COLLECTION USE CASES

§ Enabling new services and improve UX

- § Customer profile
- § PAYD insurance
- § ...others



§ Enhanced diagnostic

- § Customer notification
- § Field real-time quality monitoring for faster issues resolution



DATA COLLECTION USE CASES

- § Accelerating and improving the development of new generation vehicles
 - § Development fleets are monitored in real-time
 - § No need anymore of drive recorder (with OnStar)
 - § Analytics will help finding the correlation between root cause and issues
 - § Vehicles can be optimized based on actual customer usage



DATA COLLECTION USE CASES

The Next Evolution: Prognostics



IN SUMMARY

- § The vehicle is complex and several data are continuously available
- § The connectivity enables the collection of data from all the vehicles
- § Petabyte of data will be available to be processed

Complexity

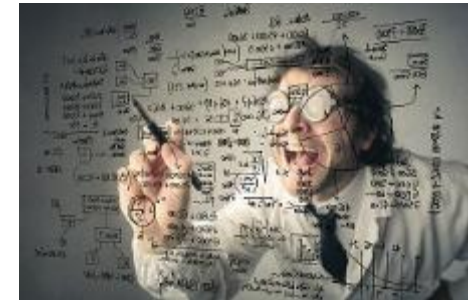


Million vehicles



THE IMPORTANCE OF DATA SCIENCE

§ “TONs” of data need processing and proper data mining knowledge



§ Machine learning techniques required to understand what the vehicles are doing



§ System modeling and Virtual Sensing techniques will become more and more important



THE VEHICLE BUSINESS CHANGES

§ Scientific skills are required to develop proper prognostic tools and system models

BUT

§ Multidisciplinary is a key to exploit the full potential of data availability



§ The usage of data goes beyond “pure” technical evaluation: improves vehicle development and enables the creation of new services

...AN EYE TO THE FUTURE

- § Smart cities are a fact not just a title
- § The achievement of a better living will pass through the implementation of connectivity & data analysis to optimize what is surrounding our daily lives
- § Data analytics will be key for a flawless implementation of autonomous vehicles



TORINO CAPITALE EUROPEA DELL'INNOVAZIONE

aprile 12th, 2016

Torino seconda in Europa per capacità di innovazione: lo ha deciso la Commissione Europea, comunicando l'esito della selezione della Capitale europea dell'Innovazione 2016 (iCapital Awards): al primo posto Amsterdam, seguita da Torino, terza la capitale francese, Parigi. "La città e le sue politiche pubbliche è il perno intorno al quale ruota un ecosistema di innovazione ricco e articolato".



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THANKS!

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