# "Driver - Vehicle Interaction: Strategies & Services to maximize Positive Effects of Technology "

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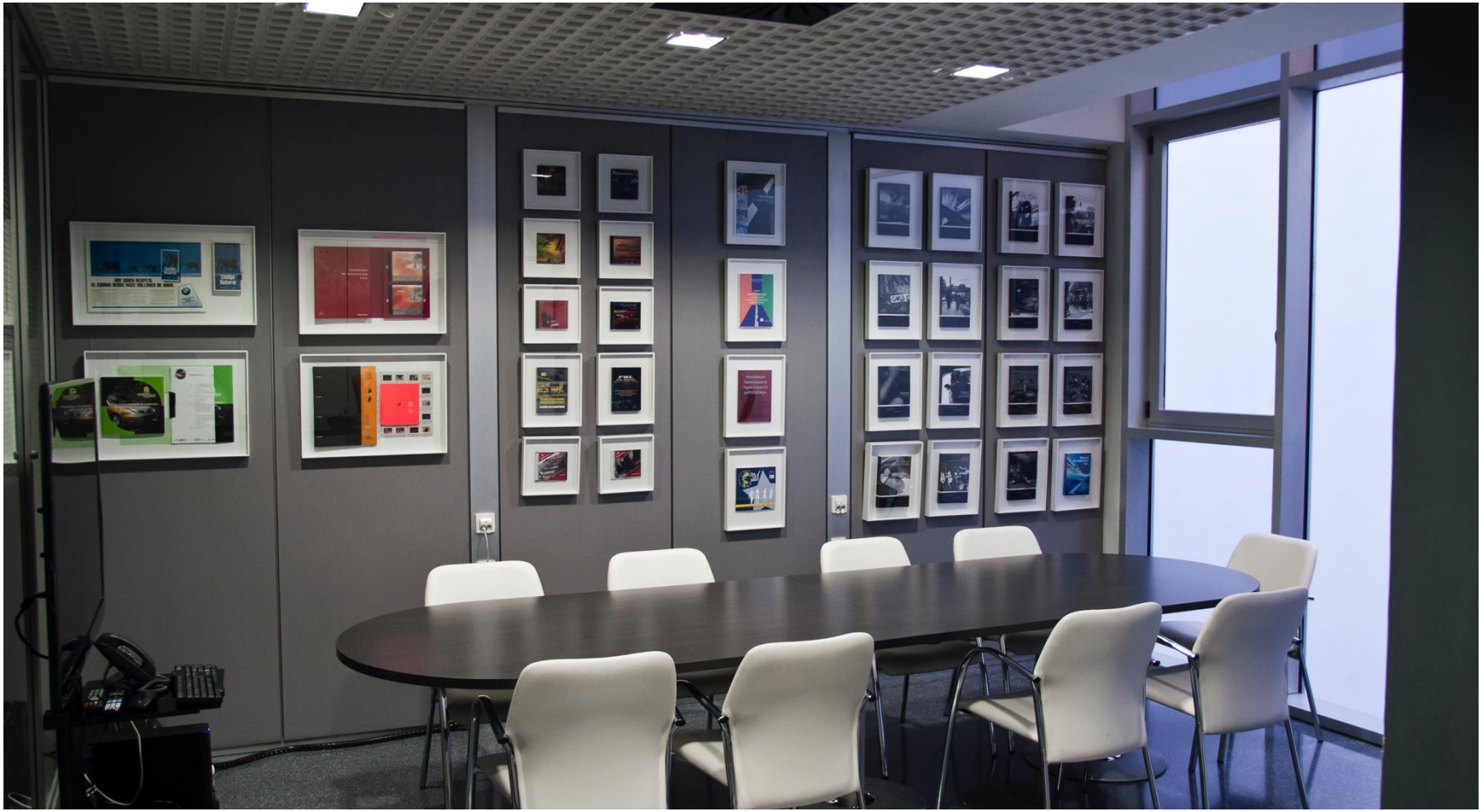
# INTRAS

## University Research Institute on Traffic and Road Safety

VNIVERSITAT DE VALÈNCIA

## INTRAS

- INTRAS (Research Institute on Traffic and Road Safety) is an interdisciplinary research centre of the UV (Universitat de València) dedicated to the scientific and applied research, the development and innovation, the training and advising in the field of road safety and traffic accidents, mainly from the point of view of the human factors and the driver's behaviour with the vehicle, the infrastructures and the police controls.
- It was set up by the decree 105/1995 of the Valencian Government, of the 16th of May 1995, under the University Reform Law and is now regulated by the Spanish Organic Law on Universities
- It is composed with teachers and researchers from several departments of the University of Valencia. Moreover, it counts upon its own research, technical and administrative staffs.



Improvement of vehicles is a particularly important measure to increase road safety.

The increase in active and passive safety systems has contributed to prevent the crashes and reduce the effects of an accident.

## I WILL TALK ABOUT…

However, the development of technology in general and particularly in-vehicle technologies, including not specifically safety-oriented, also has positive consequences other negative due to an interaction not suitable with the driver.

This presentation analyzes all of this, focusing on the main adverse consequences and the most appropriate strategies and tools to minimize them.

# STARTING POINT

Automobile safety is the study and practice of design, construction, equipment and regulation to minimize the occurrence and consequences of traffic collisions.

"Active safety" is used to refer to technology of the vehicle assisting in the prevention of a crash (tires, brakes, ABS, etc)

“Passive safety" is used to refer to technology of the vehicle that help to protect occupants during a crash (airbags, seatbelts, etc)

## CONSIDERING MORE THAN THE FUTURE

The intelligent systems address the interaction between the driver, the vehicle and the road environment, in an integrated approach where the autonomous on-board systems are complemented with vehicle-to-vehicle and vehicle-to-infrastructure co-operative technologies and improved traffic network management.

CONSIDERING THE INTERACTION BETWEEN DRIVERS AND THEIR CARS

Due to technological developments, cars have undergone a dramatic change

We must consider that
“Technological evolution has always been followed by a parallel evolution in driving skills and human-vehicle interaction”

These developments change the interaction between humans and their cars.

## CONSIDERING THE COMPENSATION OF RISK

Interaction driver vehicle have effects on driver's behaviour and skills in the long term too.

Risk compensation is a theory which suggests that people typically adjust their behavior in response to the perceived level of risk, becoming more careful where they sense greater risk and less careful if they feel more protected.

A number of studies show that drivers of vehicles with ABS tend to drive faster, follow closer and brake later, accounting for the failure of ABS to result in any measurable improvement in road safety.

A study of crashes involving taxicabs in Munich of which half had been equipped with anti-lock brakes noted that crash rate was substantially the same for both types of cab, and concluded this was due to drivers of ABS-equipped cabs taking more risks.

CONSIDERING THAT SOME TECHNOLOGIES MAY BE DANGEROUS

The proliferation of affordable in-vehicle technology has made the potential for driver distraction a pressing road safety concern in terms of crash risk and causation

# INDIVIDUAL DIFFERENCES NOT SUFFICIENTLY CONSIDERED

Some people use their car for daily, some people use the car as little as possible. Also, people drive in different contexts (urban, interurban roads, or both).

People have different needs and they do different things in different contexts.

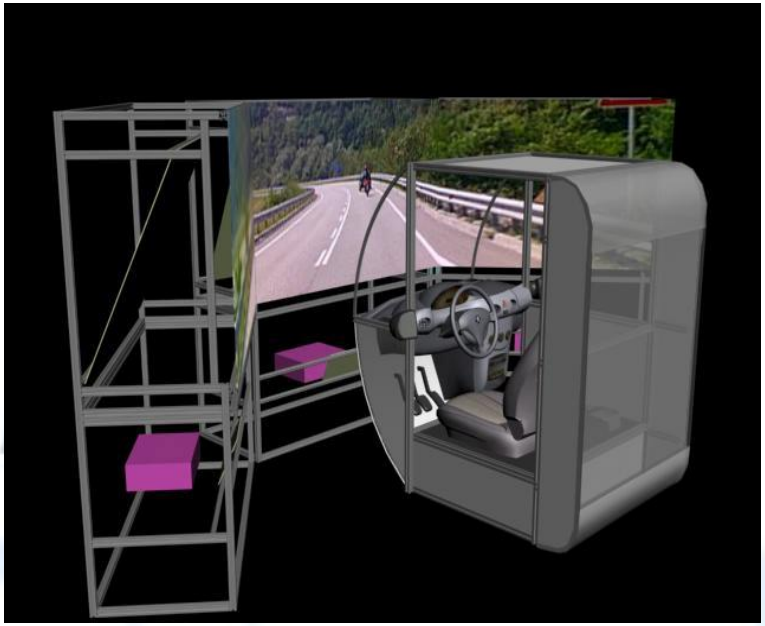
Unfortunately, most car models offer features designed to satisfy the majority of users rather than specific individuals. The car market is also based upon embedding the latest technology into new models. Thus, it is not always focused on the needs and individual differences of the user.

Principles of design for the technology in the vehicle should explore and take into account the skills, needs and preferences of drivers, physical and social settings.

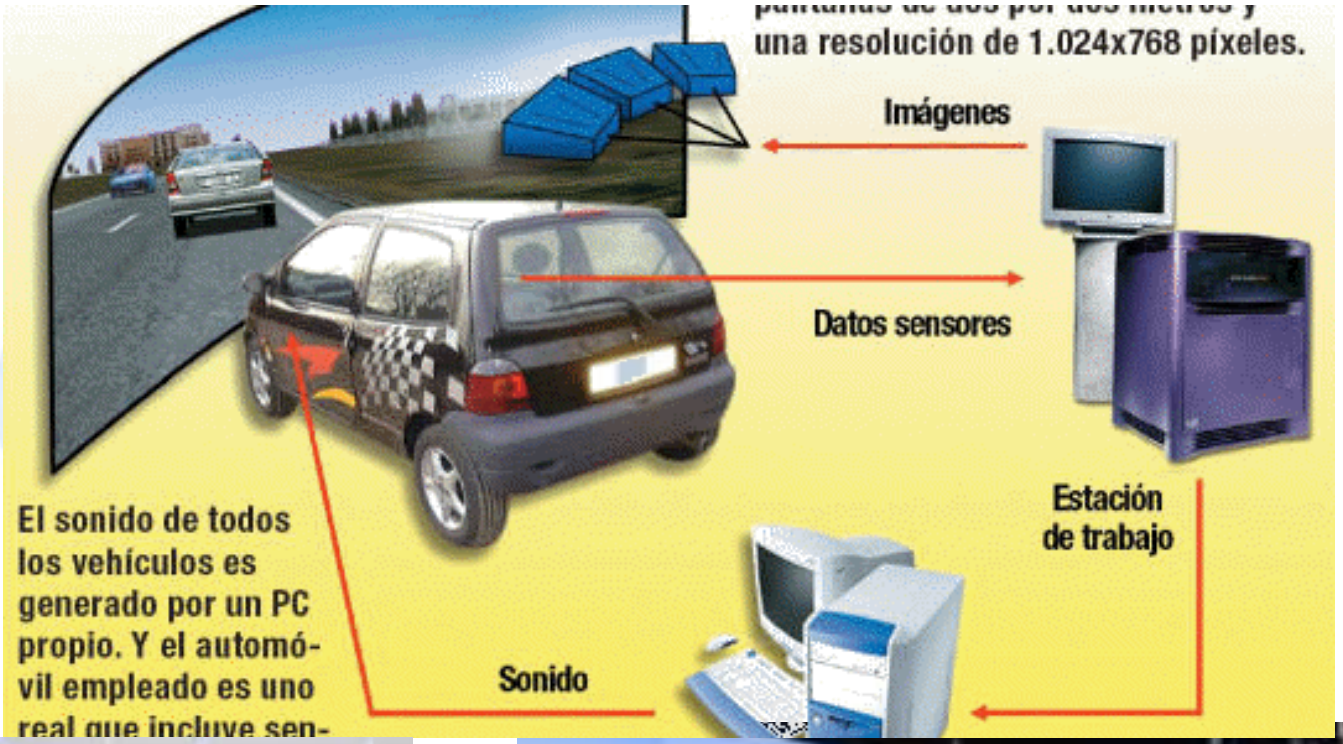
The way we interact with our vehicle is rapidly evolving. With the explosion of new features and capabilities available to the user, it’s important to ensure that the driver is still safe while driving.

## CONSIDERING PASSIVE SAFETY SYSTEMS TOO

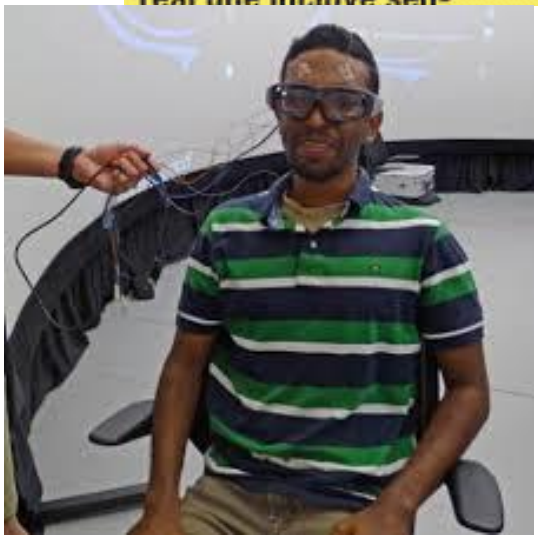
The use of some technologies as passive sistems on a car can be the difference between you surviving or being seriously injured or killed if you are in a crash.

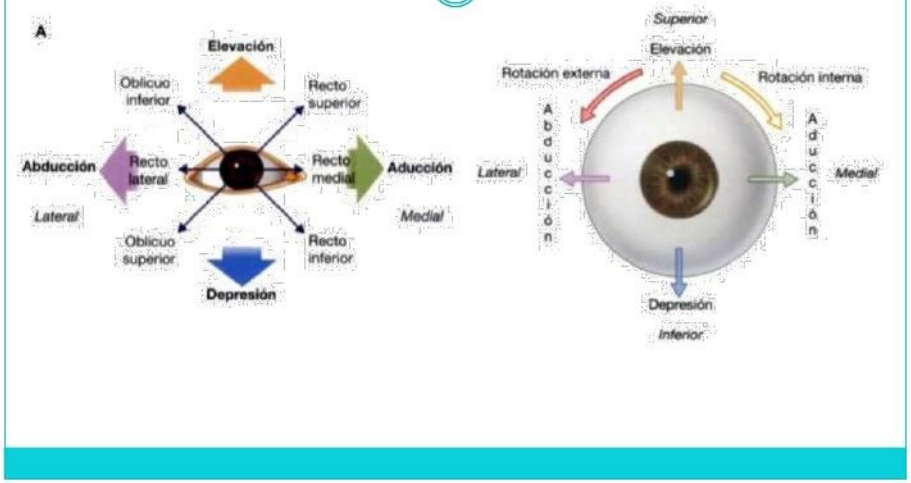


una resolución de 1.024x768 píxeles.




El sonido de todos los vehículos es generado por un PC propio. Y el automóvil empleado es uno real que incluye sen-




A
Elevación
Oblicuo inferior
Recto superior
Abducción
Recto lateral
Recto medial
Aducción
Lateral
Medial
Oblicuo superior
Recto inferior
Depresión
Superior
Elevación
Rotación externa
Rotación interna
Abducción
Aducción
Lateral
Medial
Depresión
Inferior

# Naturalistic Driving

Other system that we are developing is: UAVs

Saudi Aramco Campaign

https://youtu.be/DHGYYlCHggY

## IN CONCLUSION

The main Strategies & Services to maximize Positive Effects of Technology are:

- *All In-vehicle technology SHOULD be safely*
- *Develop more technologies adapted to the different profiles of drivers that exist.*
- *Increase research on how technologies interact with individuals both in the short term (before implementation) and in the long term (to make the necessary modifications).*
- *As automobiles become more automated and connected, it would be desirable that drivers will be trained accordingly.*
    - *Increase drivers' knowledge of how technologies are used, through better training.*
    - *Encourage the use of technology such as passive safety systems by drivers and passengers.*
    - *Treating risk compensation by conducting continuous training that contributes to increasing the perception of risk, the level of which is derived from experience.*

*Not forget that in most countries people get their driver's license forever when the technology of the vehicles changes very quickly, so the vehicles they drive do not look like they used to learn.*

*And we must use the new technologies for training (AR+ VR)*

# THANKS FOR YOUR ATTENTION!

For more information, contact us:

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