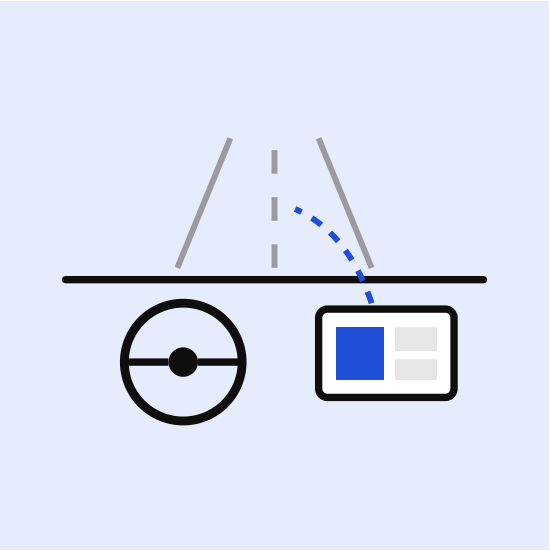
Specialty

Automotive HMI design

Designs the screens, controls, sounds and voice used to operate a vehicle, so the driver can handle them while still paying attention to the road.



In Spanish

Diseño de interfaces para vehículos

Origin

Human factors and ergonomics; NHTSA guidelines (2013)

What problem it addresses

Driving takes up the eyes and hands. Every second looking at a screen is a second not looking at the road, and with automated driving you also need to know when to take back control.

Principles

At a glance

Each task is done with short glances, without taking your eyes off the road for more than a few seconds in total.

Always clear who is driving

The person knows what level of automation the vehicle is in and when it is their turn to take control.

Test while driving

It is checked with people doing the task while measuring how long they look away.

Applications in design

Use it like this

Decide for each function whether it goes on the screen, on a physical control or by voice, and lock the ones that can't be used while moving.

Avoid

Hiding frequently used functions, such as climate control, in menus several screens deep.

Don't fall for it

Make the system warn clearly when automation stops driving and the person has to take over.

Connections

Builds on

- Stimulus–response compatibility
- Ergonomics and human factors

Related to

- UI design
- Transportation design
- Voice UX
- Haptic design

Authors and works

2013	**NHTSA**	Published guidelines for cars' built-in electronic devices: tasks shouldn't require glances longer than 2 seconds or add up to more than 12 seconds with eyes off the road.
2017	**ISO**	The ISO 15005 standard sets ergonomic principles for the dialogue between the driver and the vehicle's information and control systems while moving, and how to check they are met.
	SAE International (J3016 standard, 2021)	Defined six levels of driving automation, from 0, no automation, to 5, full automation.
2018	**Andrew L. Kun**	Reviewed research on in-vehicle interaction, from manual driving to transitions between levels of automation.

Sources

Original sources

- National Highway Traffic Safety Administration (2013). Visual-manual NHTSA driver distraction guidelines for in-vehicle electronic devices. Federal Register, 78(81), 24818. Expediente NHTSA-2010-0053. View source (https://www.govinfo.gov/link/fr/78/24818)
- International Organization for Standardization (2017). ISO 15005:2017. Road vehicles — Ergonomic aspects of transportation and control systems — Dialogue management principles and compliance procedures. ISO. View source (https://www.iso.org/standard/69238.html)

- SAE International (2021). Taxonomy and definitions for terms related to driving automation systems for on-road motor vehicles (J3016_202104). SAE International. View source (https://saemobilus.sae.org/content/j3016_202104)

Academic reviews

- Kun, A. L. (2018). Human-machine interaction for vehicles: Review and outlook. Foundations and Trends in Human-Computer Interaction, 11(4), 201–293. View source (https://doi.org/10.1561/1100000069)

Last reviewed: October 25, 2026

Atlas público de diseño, de Adriana Ojeda. Texto e ilustraciones bajo licencia CC BY 4.0.