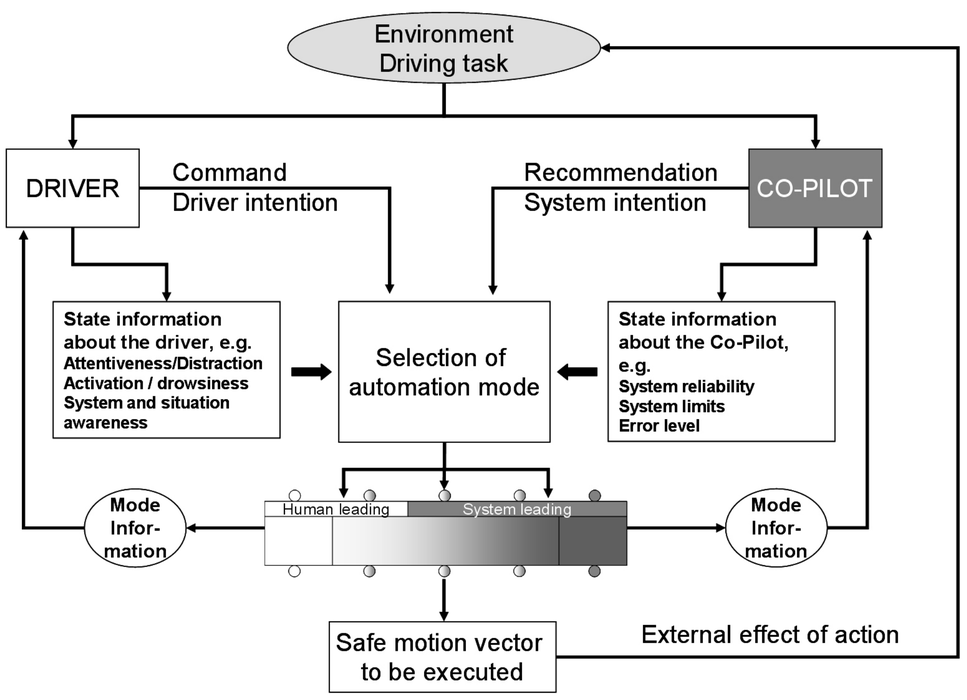
Highly Automated Vehicles for Intelligent Transport (HAVEit)

HAVEit aims at significant improvement in terms of traffic safety and efficiency by following measures: By further developing and implementing the failure tolerant, safe vehicle architecture including advanced redundancy management from the SPARC predecessor project to suit the needs of highly automated vehicle applications, by developing next generation ADAS with an optimized, easy to handle task repartition between the driver and the highly automated vehicle, and directed towards higher level of automation compared to the current state of the art. HAVEit integrates 6 cutting edge vehicle applications for both passenger cars and trucks.

The vision behind: highly automated driving to improve overall safety

The key actor for safe driving must be the driver. Everything has to be done to optimize her/his performance. An automation centered on the driver is an important tool to achieve this goal. Taking into account that the need for assistance strongly depends on the varying performance level of the driver, the need for a variable task partition between driver and automation becomes obvious. Higher degree of automation in this context means to support the driver in monotonous driving tasks (e.g. queuing on crowded motorways, continuous lane keeping) as well as in highly demanding tasks like automated merging when entering a construction site. Automation must be designed in a way that different degrees or stages of support can be flexibly produced (ranging from mere warning up to a temporary auto-pilot).

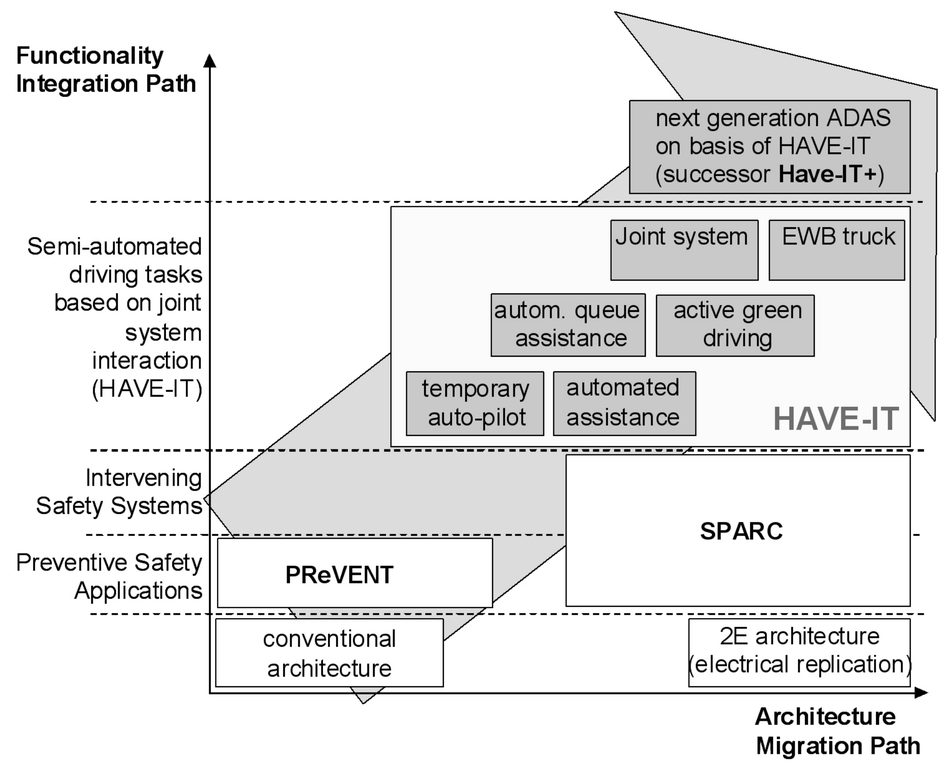


Optimizing task repartition in the joint system driver - co-pilot system

Joint system Driver-Copilot

Current ADAS are switched either "on" or "off", a severe disadvantage in case of systems integrating different functions. If one part of the integrated system shows malfunction or reaches its system limits, the remaining parts of the integrated system may still work correctly or must only be degraded in part. The same holds true for the driver. There may be an intention for maximum automation in some situations, whereas part assistance may better fit to other driving situations.

Also, different alertness states of the driver (e.g. sleepiness) may prohibit switching in a highly automated mode. Therefore, one basic idea of HAVEit is to define different degrees of automated driving which can be selected according to the needs of the driving task. HAVEit vehicles will contain a sophisticated co-driving system that can perform a higher percentage of the driving task automated. The co-pilot system is usually dependent on the driver to allow, supervise and/or participate in the automated behavior. If well designed, driver and co-pilot system form an ideal symbiosis, a joint system that drives better and safer than any of the two partners would be capable alone. One essential key to such a successful combination of human (driver) and automation (co-pilot system) lies in the proper design of the transitions between lower and higher degrees of automation.



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