

ABSTRACT

AUTONOMOUS DELIBERATIVE TRAFFIC LIGHTS

The device and method of the invention implements a road traffic regulation system for traffic lights, equipped with an orientatable image capture module, an embedded system equipped with hardware acceleration, a command system, a hardware watchdog and a secure wireless transmission module.

This system allows to take control of intersections with traffic lights in a completely autonomous and smart manner requiring no centralized management or installation, in particular an intersection controller, by adopting dynamic and adaptive regulation plans according to the traffic reality.

Indeed, the orientatable image capture module allows to capture road traffic images in a raw format, i.e., uncompressed. The image stream is routed to the embedded system through a high-speed link. The embedded system is a processing unit equipped with hardware acceleration. The embedded system ensures processing of video streams by means of artificial intelligence mechanisms in order to extract decisional information therefrom with respect to the regulation plan. The wireless transmission system allows this information to be shared with the rest of the smart light modules in a secure way. Thanks to a distributed algorithm, the smart traffic modules calculate the best regulation plan in relation to the traffic reality. Thanks to the command system, the various light modules are mastered according to the calculated regulation plan. The hardware watchdog allows to ensure proper system operation and to take control, if necessary, after it has been initialized.

In this way, a completely distributed and autonomous coordination takes place between the various devices of the invention. This coordination can be limited to the scale of the intersection, or be global integrating data from other intersections on the global scale of the road network.

Figure 1