

Anti-collision for smart vehicles based on Visible Light Communication (VLC)



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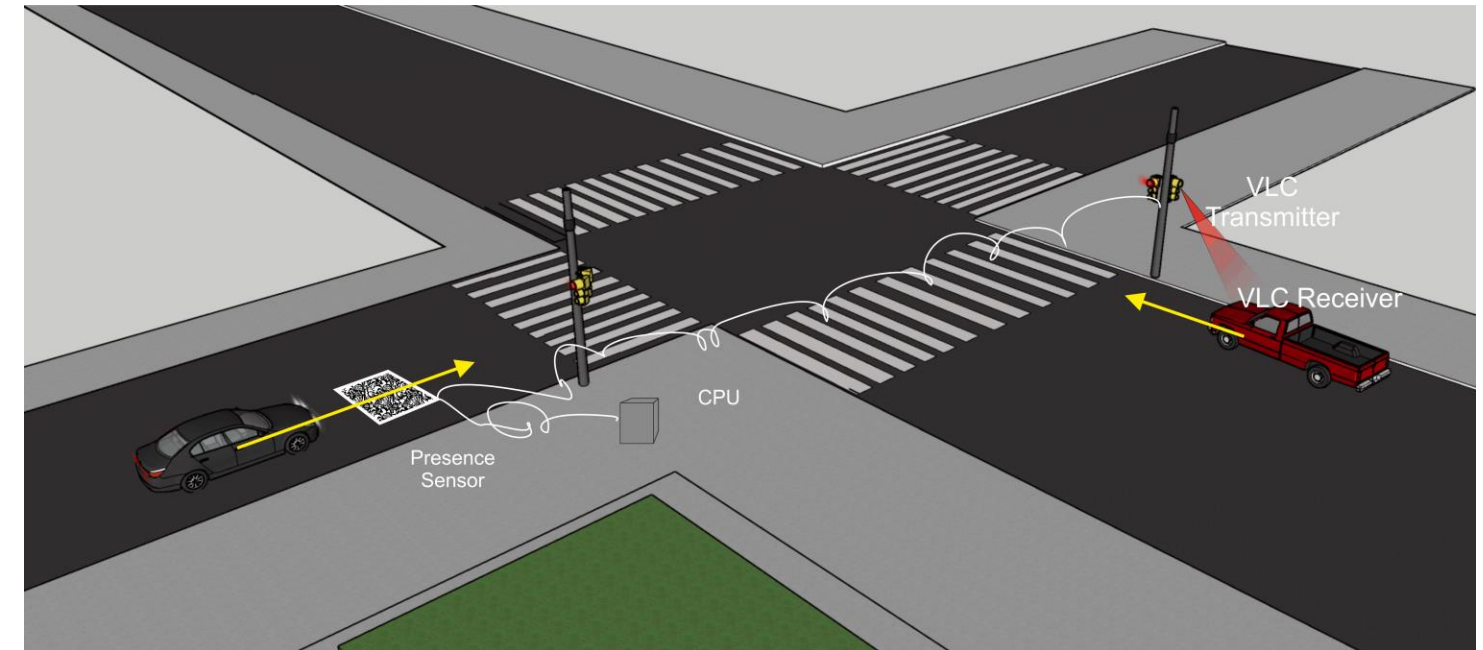
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Invention



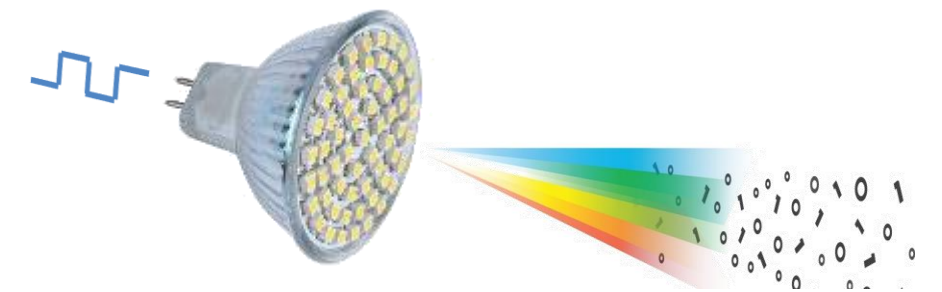
- **TARGET of invention**

Collision avoidance system at road intersections



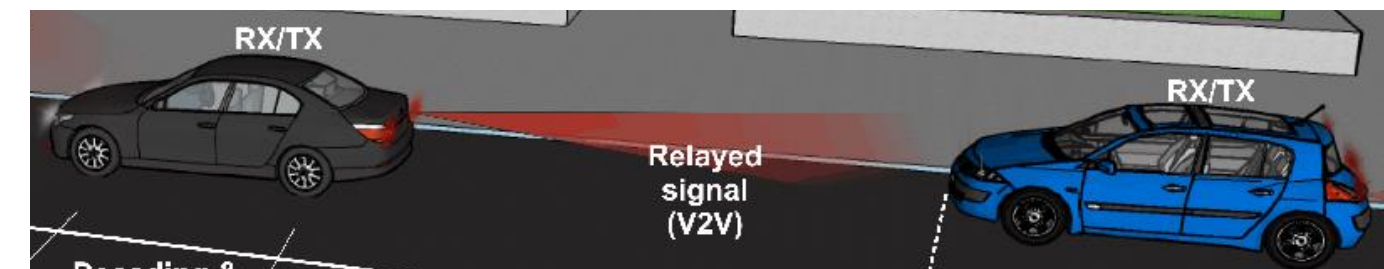
- **TECHNOLOGY INVOLVED**

- The invention exploits an innovative technology known as **Visible Light Communcation (VLC)**



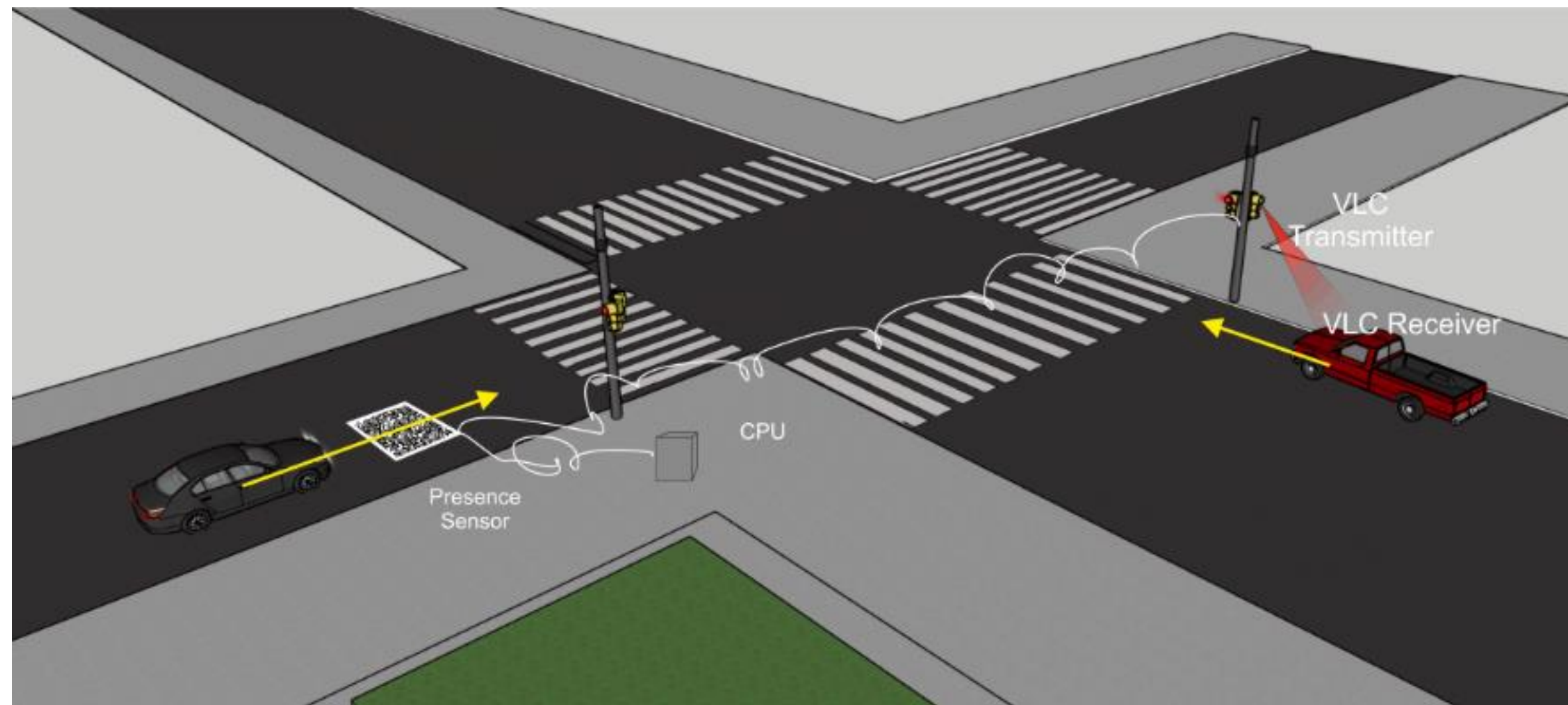
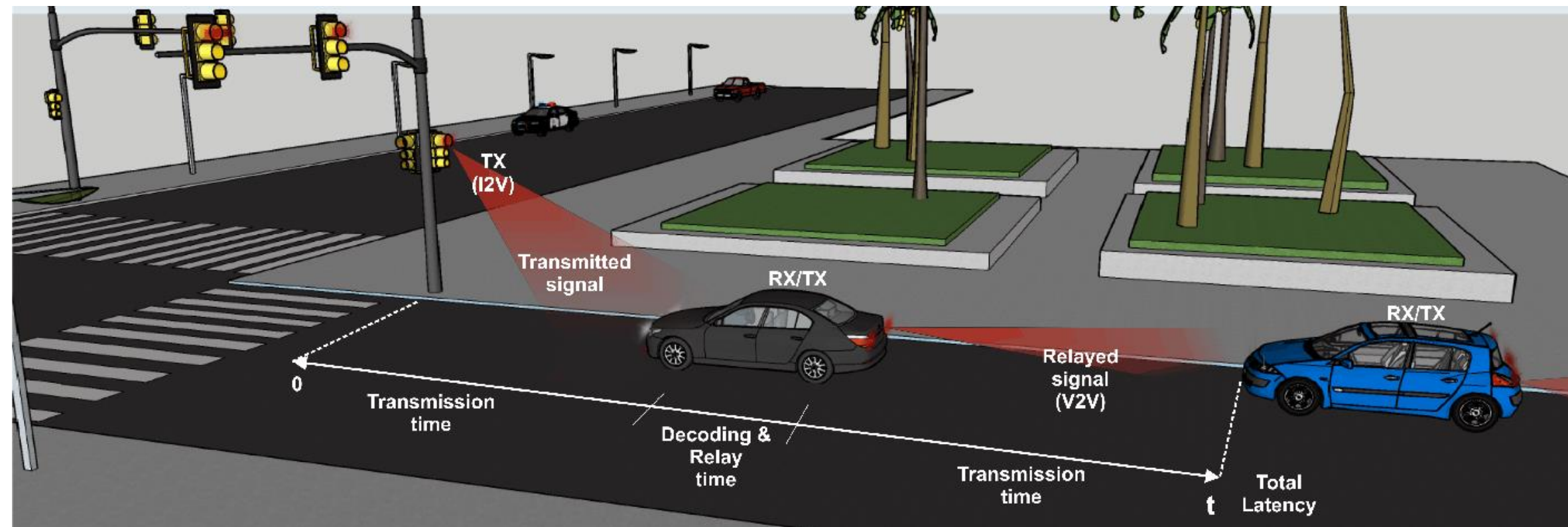
- Ordinary LED-based **traffic lights**, car **headlamps** and **tail lights** can be used to also provide **WIRELESS DATA COMMUNICATION** besides standard **illumination** and **signaling**, through intensity modulation of LED sources, which is **NOT perceived by human's eye**.

- **ADVANTAGES over existing technologies**



- **Very low latency** demonstrated (< 1ms) allowing for **much faster reaction times of vehicles** to adverse events.
- **High versatility**: any LED-based light source is virtually source of digital information
- **No Radiofrequency pollution**: the digital channel is realized through light, so no RF radiation is required for wireless transmission
- Compatible with **5G** latency standards

Drawings & pictures



Industrial applications



- **Automotive sector:** Integration of transmitters and receivers in LED lighting and signaling systems (brakes / headlights)
- **Public lighting and road signaling sector:** Installation of roadside sensors and VLC traffic light transmission system in smart traffic lights lanterns
- **Possible extension of the reference market:** worldwide

Possible developments



- **Pervasive networks:** extension of VLC technology to indoor environments using white LEDs
- **Dedicated services** exploiting local nature of VLC channel:
indoor positioning, Augmented Reality (e.g. Museums)
- **Industry 4.0:** realization of wireless networks in harsh environments where WiFi is not working
- **Hospital 4.0:** realization of wireless connections in EM-protected environments such as surgical rooms, intensive care units etc.
- **Defense:** Exploit VLC for underwater communications where RF comm is not suitable

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