



FP7 Coordination and Support Action to fund 50 technology transfer projects (TTP) in computing systems. This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement n° 609491.

Non-contact, Non-intrusive Machine Vision-based In-vehicle Distraction Sensor (mDrive)

Janez Perš, Simon Dobrišek, Faculty of Electrical Engineering, University of Ljubljana, Slovenia

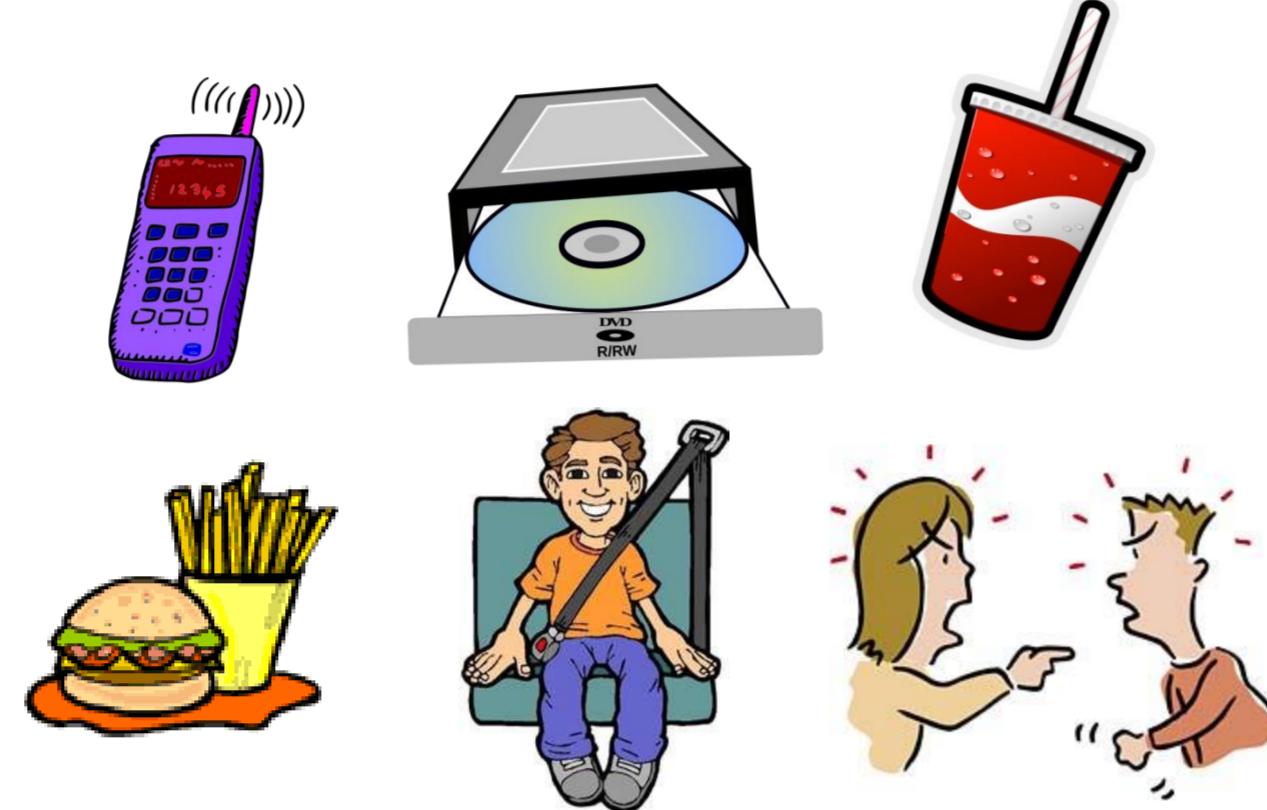
TiBoPo d.o.o., Slovenia

TTP Problem

Driver distraction: a major problem for **road safety**.



Sources of distraction



And more!

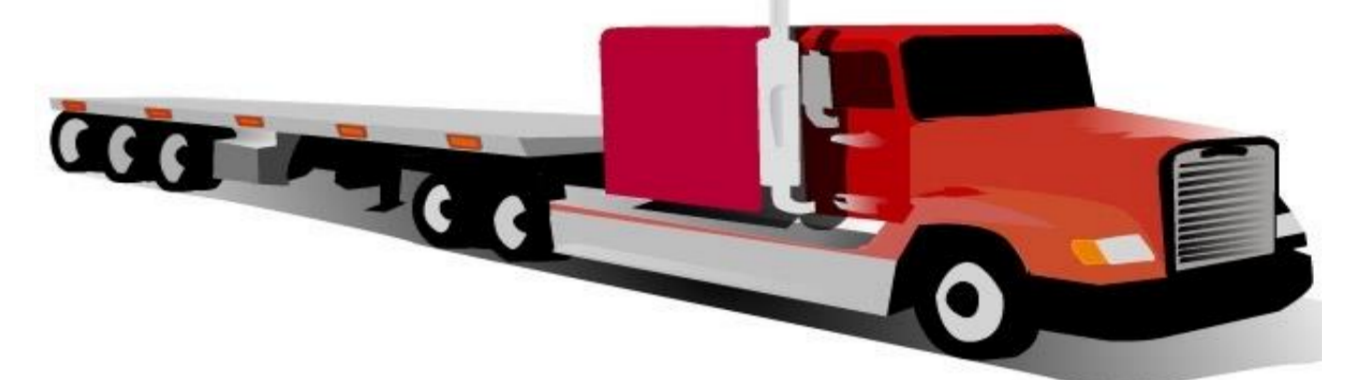
Types of distraction

- Visual
- Cognitive
- Manual

Difficult to define unambiguously!

Especially difficult problem for **professional** drivers.

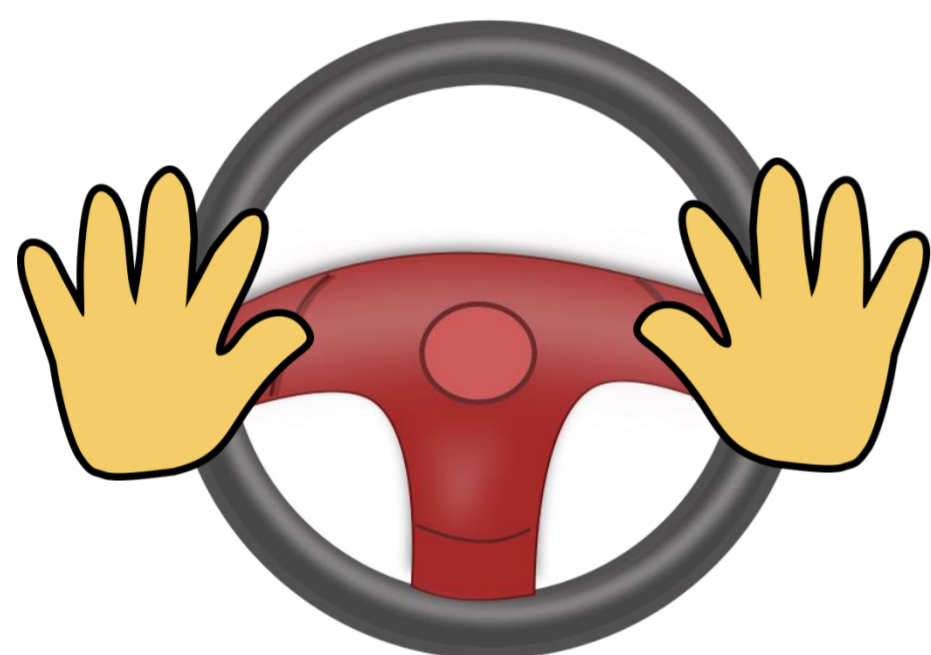
- Long hours on the road
- Challenging tasks are **rare**, but require **sudden** attention
- Potentially **huge damage** in accidents



TTP Solution

Idea

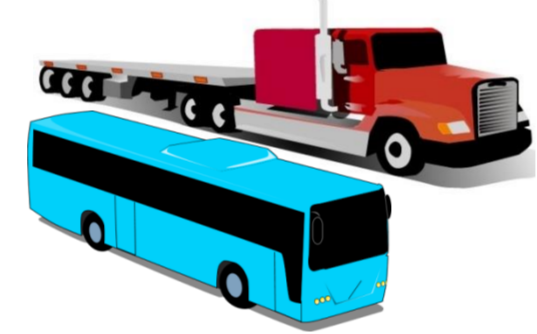
Hand position on the wheel can be used as proxy for detecting driver distractions



This is not a perfect solution, but it is **well defined**, **observable**, and therefore appropriate for large-scale deployment in even in commercial environments (objective measurements)

Constraints

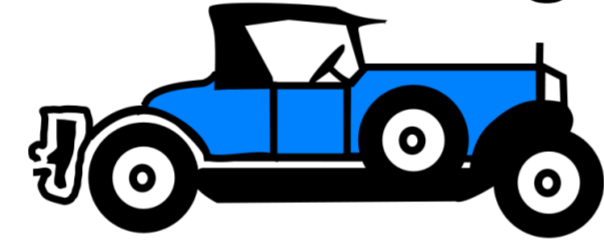
Commercial use



Zero maintenance



Suitable for retrofitting



No changes to the steering wheel



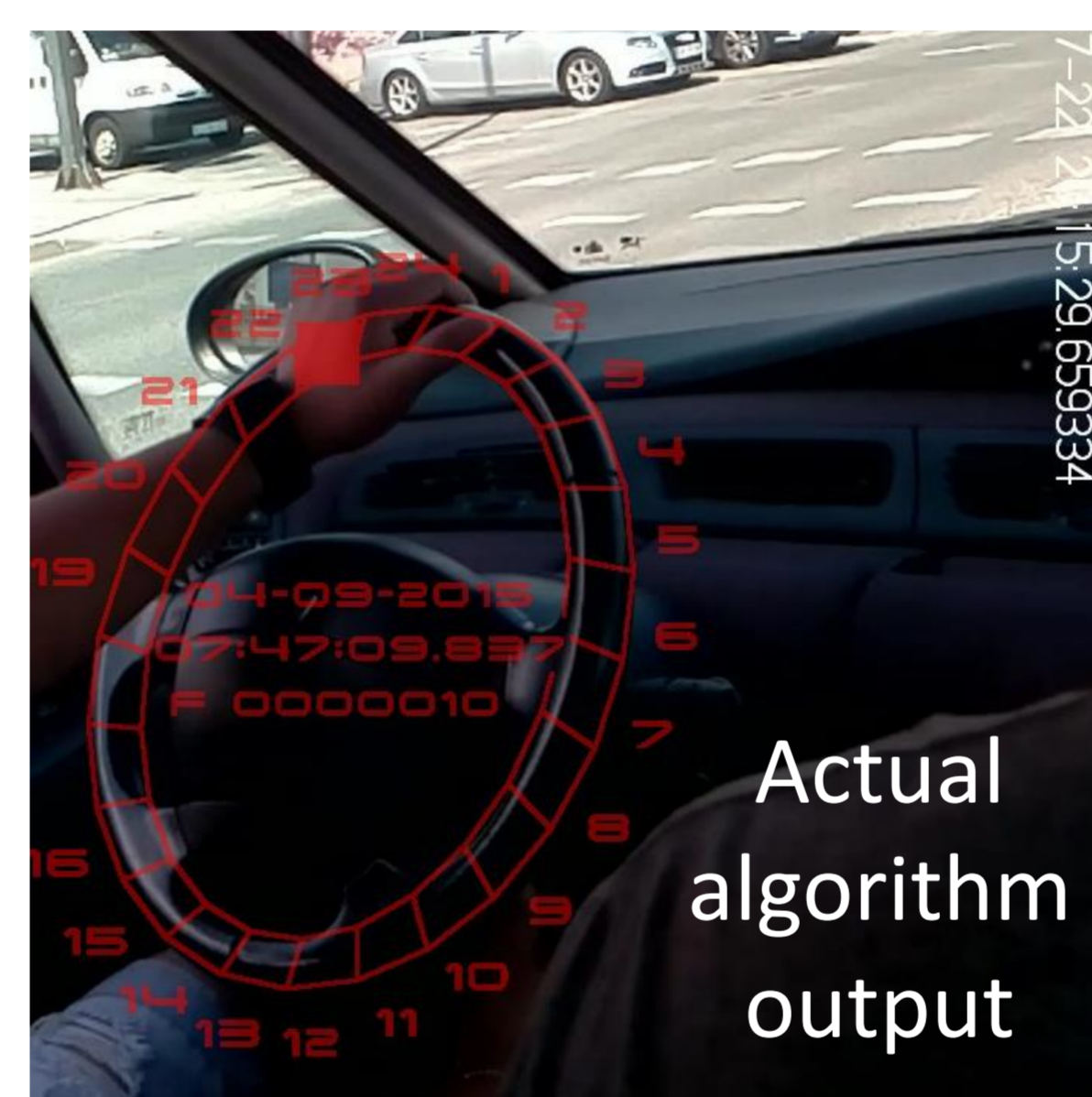
Remotely manageable and upgradeable



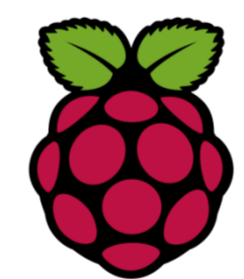
Use: positive feedback



Solution



- **Machine vision**-based solution
- **Embedded** vision system based on Raspberry Pi 2
 - 4 core 900 MHz ARM
 - ~2 cores used @ 10 FPS



Raspberry Pi is a trademark of the Raspberry Pi Foundation.

TTP Challenges

- Adapt the system to automotive environment
- Fully autonomous operation: NO buttons, NO interaction with the driver, 100% self contained
- Streamline HW design
- Analyze privacy impact, with input from the Information Commissioner – to avoid the label “video surveillance device”!
- Perform large scale test, to provide accuracy % used in marketing of the product

TTP Impact

- According to EU, **road safety** is major societal issue
 - In 2011, **30.000** people **died** on EU roads.
 - Driver distraction is a major issue in road safety.
 - Collision warning systems do little to prevent driver distraction, actually, they may make situation worse
- mDrive will provide a mechanism for fleet managers to **reward responsible professional drivers** based on **objective** data.

- mDrive will be a **versatile** automotive **machine vision** platform with CPU power to spare.
- After release to the market, TiBoPo will continue to develop machine vision algorithms to address **other safety issues** on the same automotive HW platform (e.g. object detection)
- mDrive will further contribute to road safety and TiBoPo's revenue stream

TTP Facts

Contact: Janez Pers
E-mail: janez.pers@fe.uni-lj.si
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Univerza v Ljubljani

TiBoPo

