

## EXTERNAL VISION AND/OR WEAPON AIMING AND FIRING SYSTEM FOR MILITARY LAND VEHICLES, MILITARY AIRCRAFT AND MILITARY NAVAL UNITS

Main Technological Area → Sensors

Keywords → View, Targeting, Aiming, Firing, Reticle, Tracking, Video

The solution described in the patent can be adopted on board of a combat unit, in an operational scenario which includes aiming and shooting activities. The video stream, acquired by a camera placed outside the cockpit, is shown on the operator's display and overlapped with an aiming reticle. Some parts of the reticle will change color, based on the algorithms specified in the patent, in the case where the aiming reticle has a colour easily confused with that of the target or with the background in the displayed video stream.

### TECHNICAL SPECIFICATIONS

A processing unit receive the video stream taken by an external camera, constructs the pointing reticle, superimposes it on the video (overlay) and show the resulting image on the operator's display. In systems normally in use, when an event of sudden changes in the scenario taken by the camera happens, it's an operator's task to act on the display controls to modify the chromatic characteristics of the grid to improve the readability of the scenario and the tactical information.

The novelty described in the patent relates to a methodology applied to the video stream by the processing unit; according to a specific algorithm, the video signal captured by the camera is converted from the RGB color space to the CIELAB space (CIE L \*, a \*, b \*), and the resulting color information for a specific, central region of the video is further processed. Based on the result of the processing, the color of some parts of the reticle is automatically modified so to maximize the color contrast with the video, and make the scenario more readable by the operator.

Therefore, the invention is a visual aid that allows to improve the efficiency of the operations of aiming, tracking and reaction against hostile targets; in its original field of use it is effective in many applications in which aiming and shooting are important: land vehicles (such as tanks, mine-clearance vehicles, armed land vehicles, etc.), military aircrafts, helicopters and naval units.

### INNOVATION/ADVANTAGES

- Improvements on Situation Awareness when in operating scenario
- Man-Machine Interface greatly simplified for a more accurate aiming of the optoelectronic device
- Minimizing operator reaction time
- Possibility to easily retrofit existing systems

### FIELDS OF APPLICATION

<b><i>EO Sensor</i></b>	Video signal processing (visible, infrared, multispectral)
<b><i>Difesa</i></b>	Aiming and shooting systems in operative scenario on board of etherogeneous units (land vehicles, aircrafts, helicopters and naval units)
<b><i>Simulazione</i></b>	Real-time processing in simulated tactical situations
<b><i>Biomedicale</i></b>	Improvements of readability in diagnostic imagers systems

PATENT INFORMATION

**Priority Date** - 04/09/2014

**Priority Code** - TO2014A000696

**IPC Codes** - F41G3/16

**Active worldwide applications**

Italy - IT1425923; **filing date:** 04/09/2014; **grant date:** 17/11/2016

EPO - EP3189297; **filing date:** 23/03/2017; **grant date:** 11/07/2018

National Extensions: Czech Republic – Slovakia – Germany – Spain – France – United Kingdom – Italy – Poland

PAKISTAN - 563/2015; **filing date:** 03/09/2015; **grant date:** Pending

USA - US9599436; **filing date:** 03/09/2015; **grant date:** 21/03/2017

ISRAEL – 250704; **filing date:** 21/02/2017; **grant date:** Pending

**Leonardo internal code**

LDO-0520