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Embedded Image Capture System for Liquid Monitoring in the Smart Chemical Industry

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Embedded Image Capture System for Liquid Monitoring in the Smart Chemical Industry

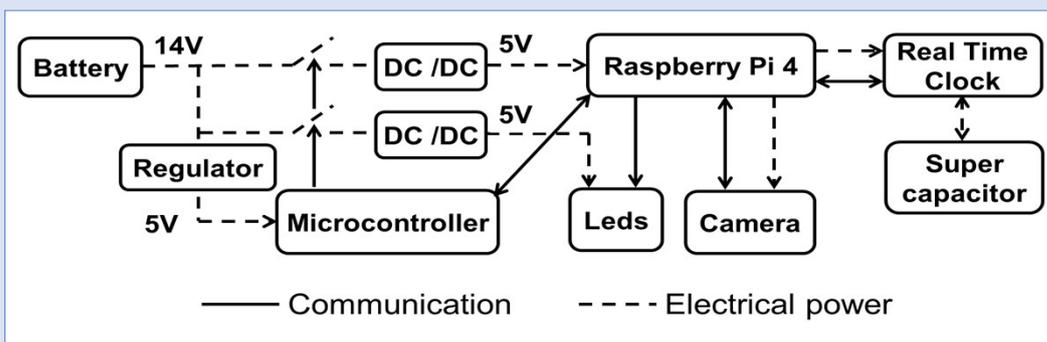
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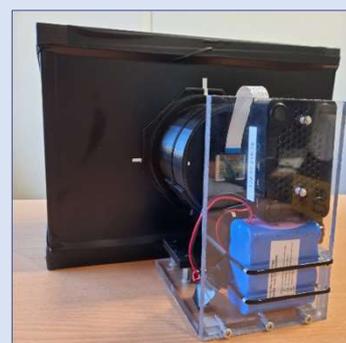
n.boussaada@estia.fr; g.terrasson@estia.fr; a.llarra@estia.fr; o.curea@estia.fr



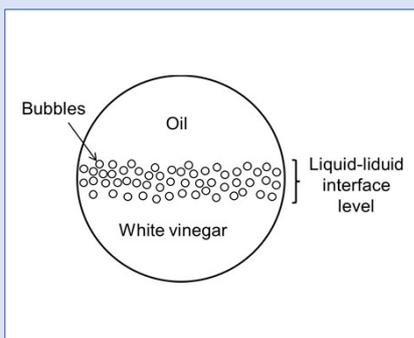
This paper proposes a contribution aiming to improve the captured image exploitability in a visual supervision system dedicated to the Smart Chemical Industry. For that we perform a study of the color light effects on captured images. One visual sensor node, based on Raspberry Pi and a camera, is designed to conduct experiments. In addition, a laboratory glass container including liquids is developed and used as an emulator of the real system.



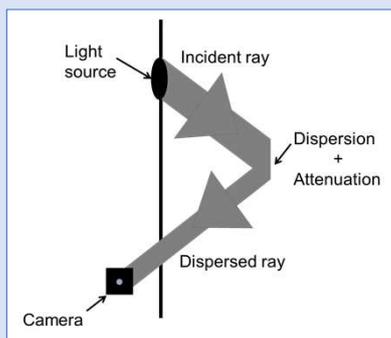
Architecture of the proposed sensor node prototype



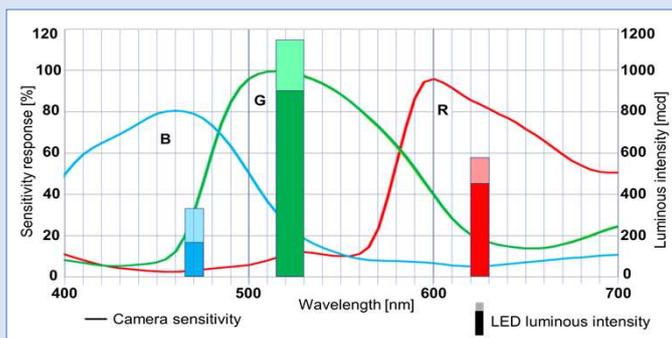
Experimental platform



The phenomena to be monitored



The Beer-Lambert-Bouguer law



RGB layers camera sensitivity and LED luminous intensity

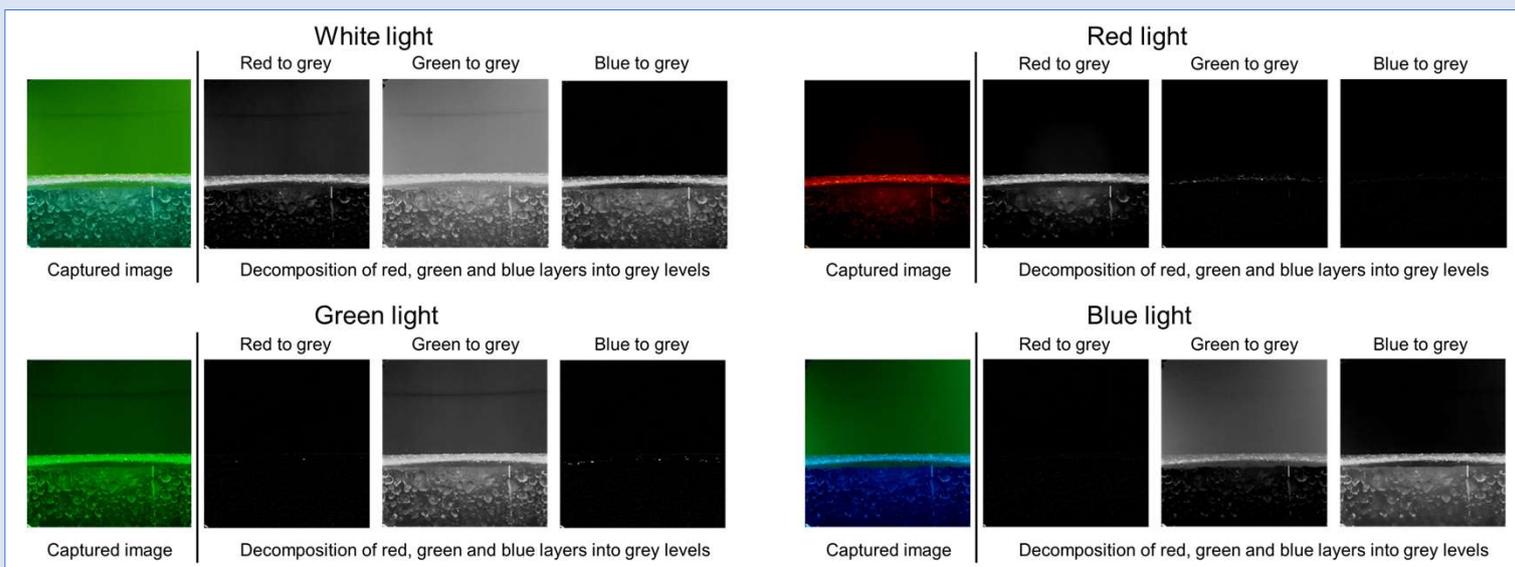


Image capture applying white – red – green - blue light

CONCLUSIONS

This work studied the color light effects on captured images in chemical industrial context. Based on the Beer-Lambert-Bouguer law, it has been demonstrated that an attenuation due to the crossed liquid materials properties could undergo when applying light in the instant of image capture.

The obtained results showed that the green layer of the green light source gives the best details of the image. This confirms the impact of the light source and camera settings on the proposed VWSN performances.

The designed sensor node will be installed on the real site and will capture images during 2 or 3 weeks, to collect a representative set of images to process.