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Transmittance photoplethysmography with near-infrared laser diodes in intra-peritoneal organs

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Abstract— Photoplethysmography and pulse oximetry are techniques based on optical principles, which are widely used in medical practice for non-invasive monitoring. There are some processes which may affect specific organs or parts without a significant repercussion on the information provided non-invasively. Here, we report on the preliminary results obtained by transmittance photoplethysmography in pig intra-peritoneal organs along a surgical intervention, using a measurement system based on two near-infrared laser diodes. Analysis of the signals recorded at 750 nm and 850 nm in the mesentery root, mesocolon, gastric wall and aorta artery has shown the affordability of performing in situ photoplethysmography for visceral perfusion evaluation.

Index Terms— Laser diodes, optical sensor, photoplethysmography, viscera

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