

## Remote thermography for respiration rate monitoring

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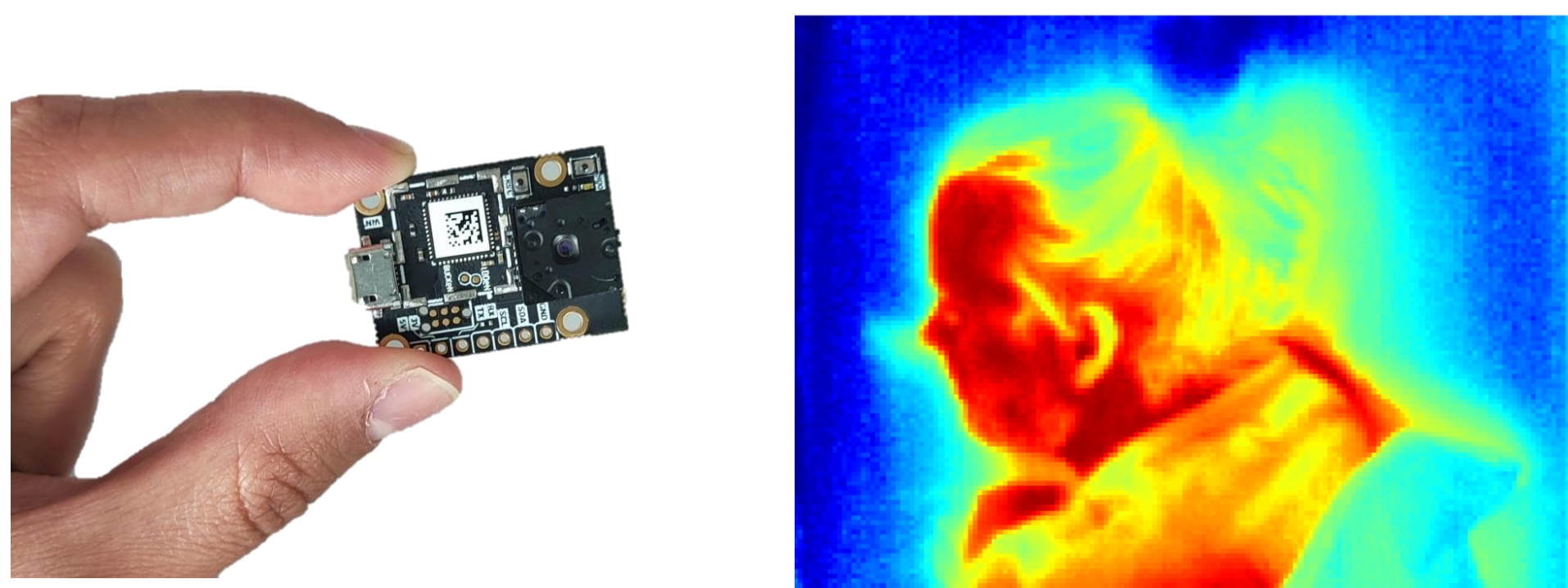
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# Remote thermography for respiration rate monitoring: a study into the optimal experimental setup

Raquel Alves, Fokke van Meulen, Mark van Gastel, Wim Verkruijsse, Sebastiaan Overeem, Sveta Zinger, Sander Stuijk

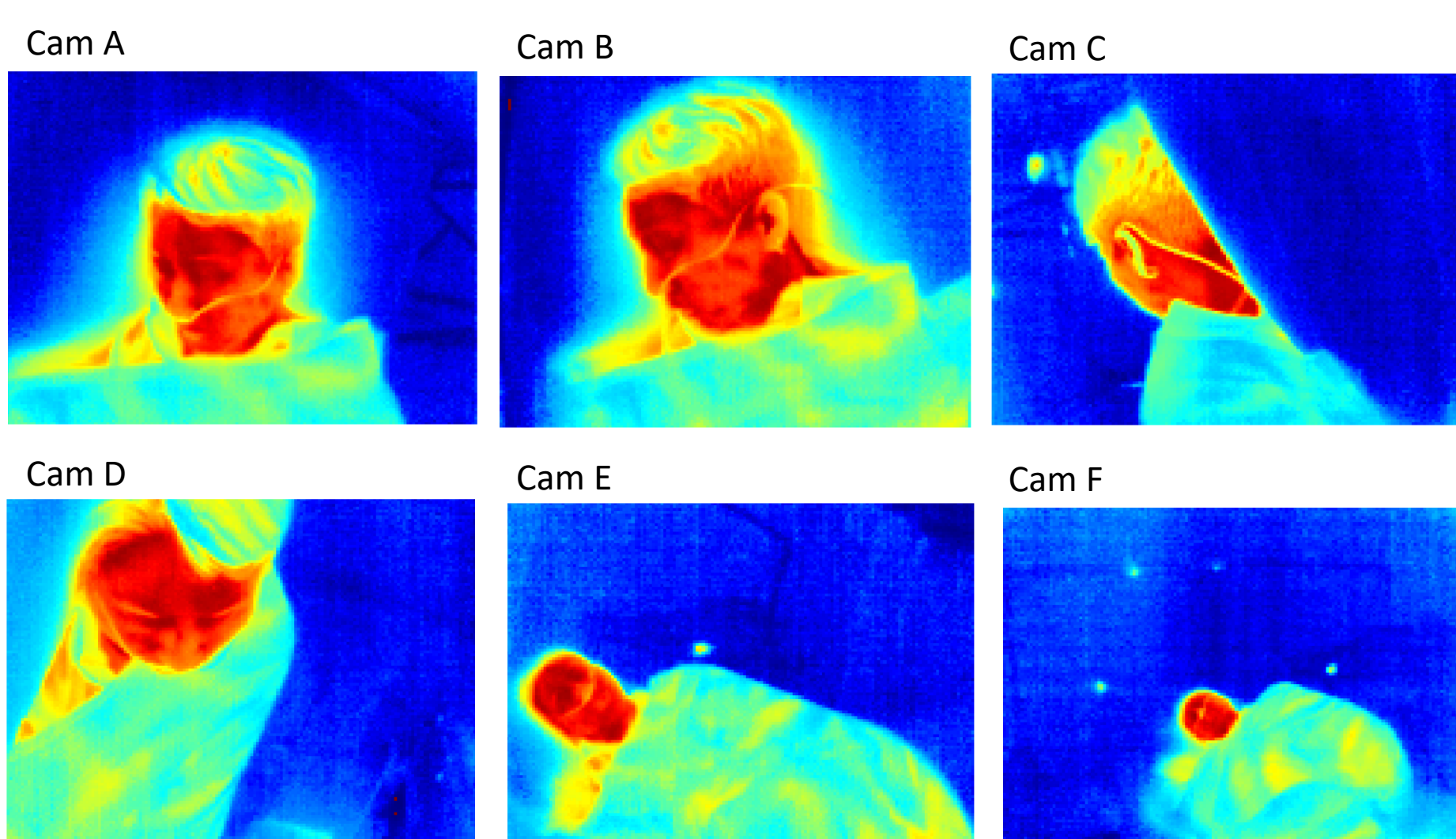
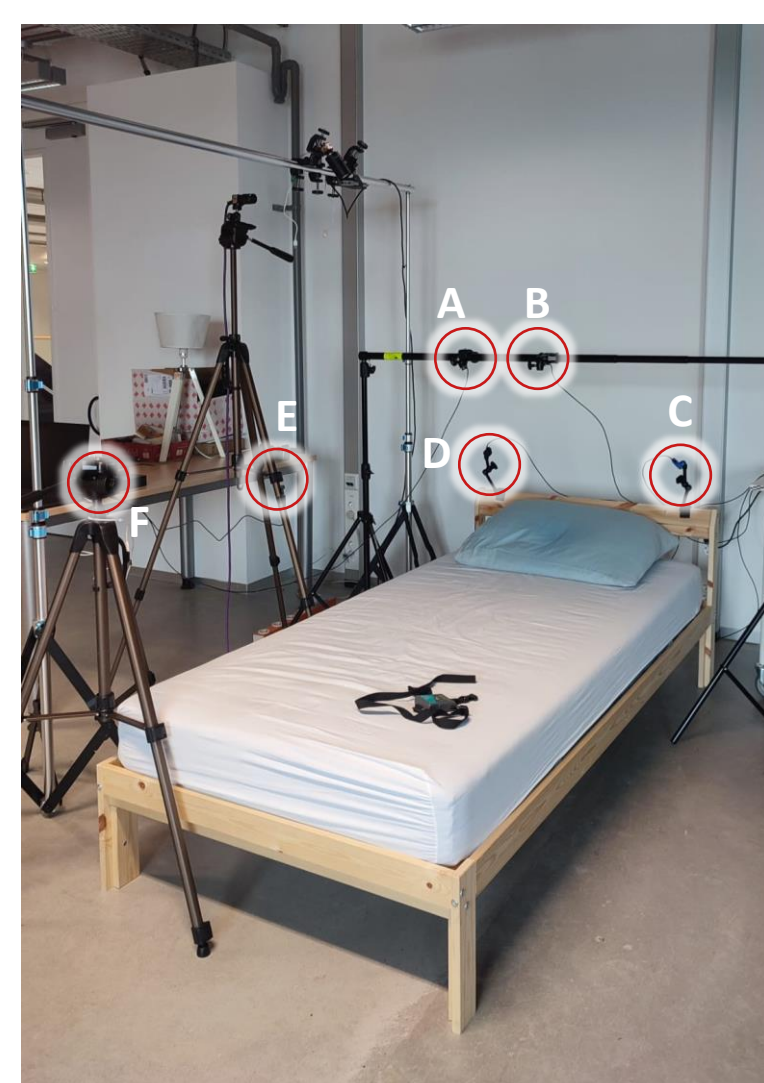
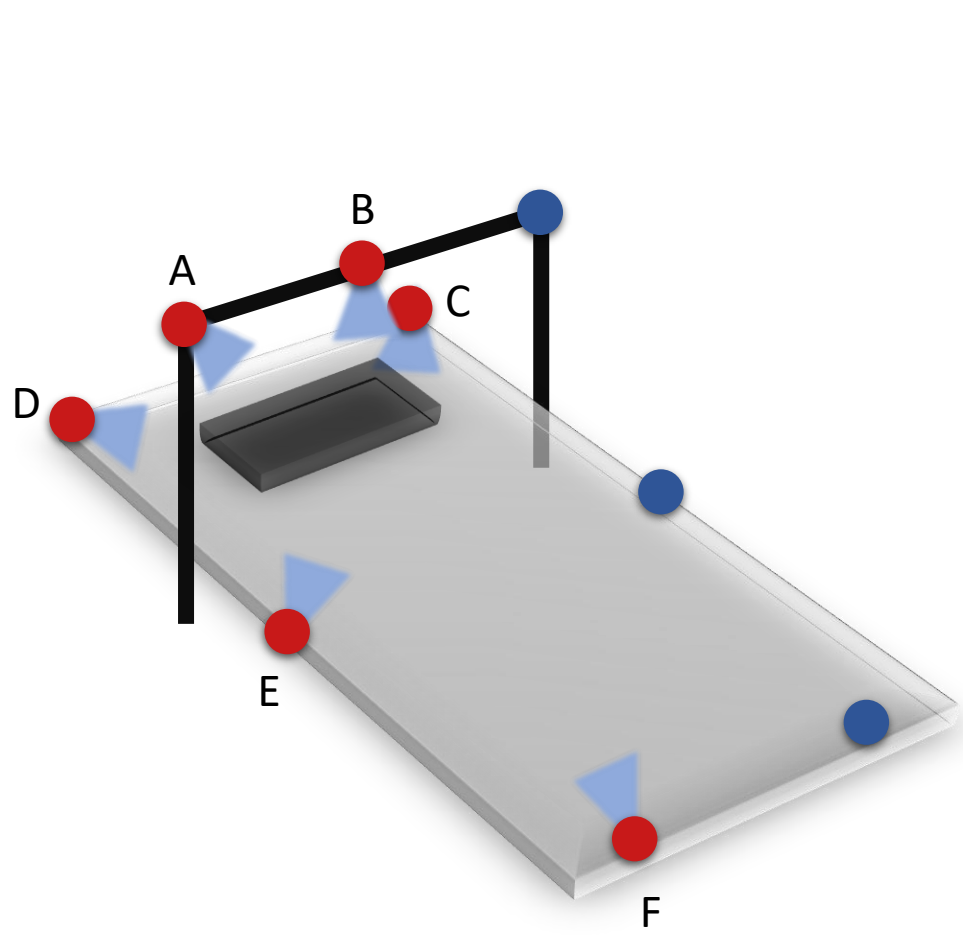
**Thermal cameras** can be used to monitor respiration flow and motion by detecting chest movements and temperature variations caused by breathing airflow, respectively [1]. We aim to apply this to unobtrusive monitoring of sleep apnea. Our solution will enable contactless monitoring and thereby remove the high amount and inconvenience of contact sensors.



**GOAL:**

Find the ideal number of thermal cameras to use and where to place them to have accurate measurements.

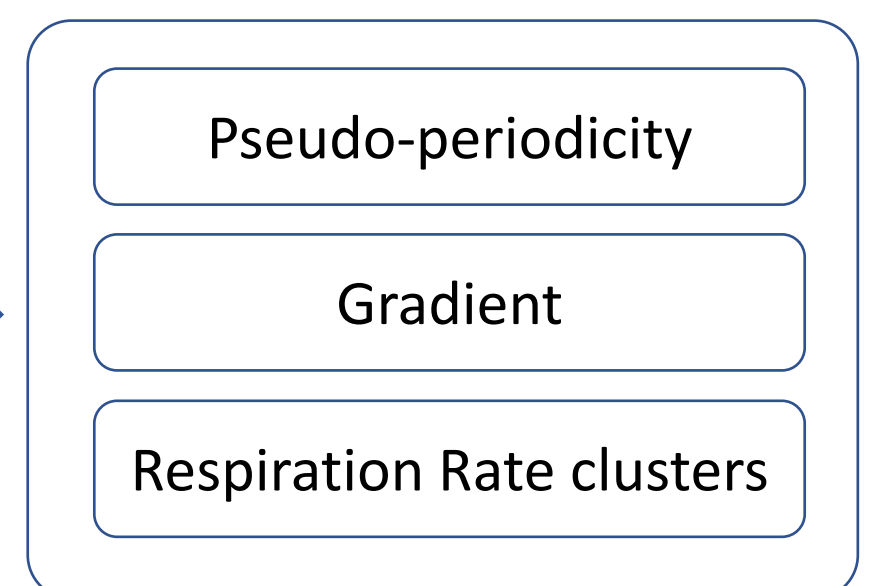
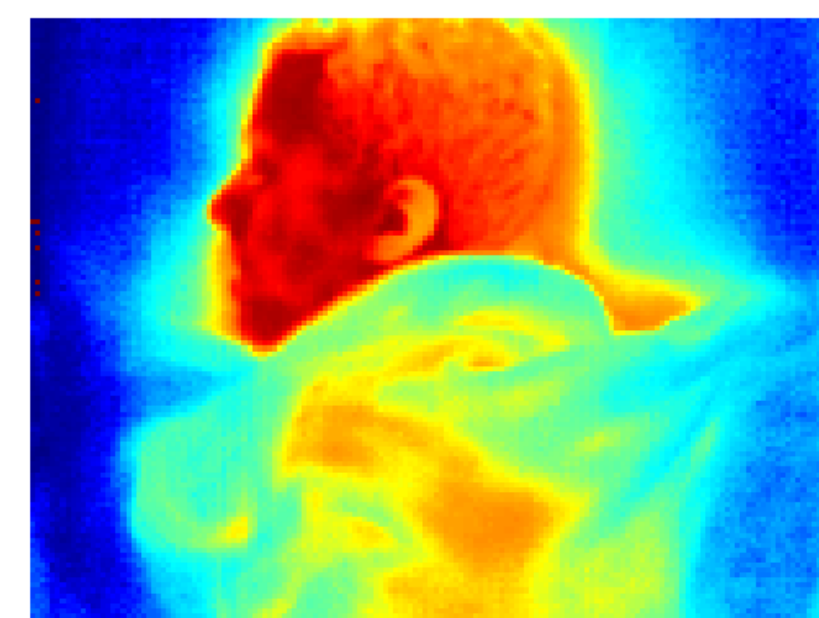
Experimental setup:



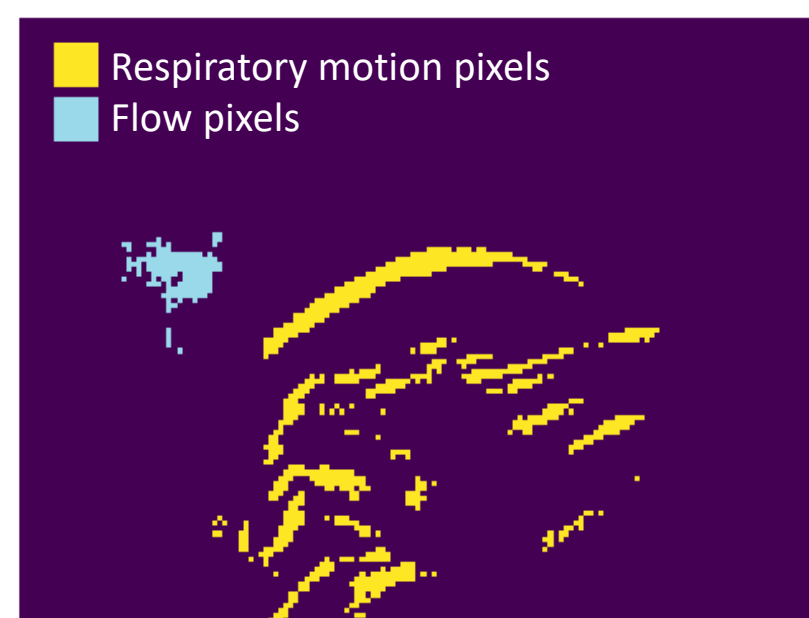
**DATA PROCESSING:**

The acquired videos for each camera (and each subject and trial) are processed with Lorato's algorithm [1].

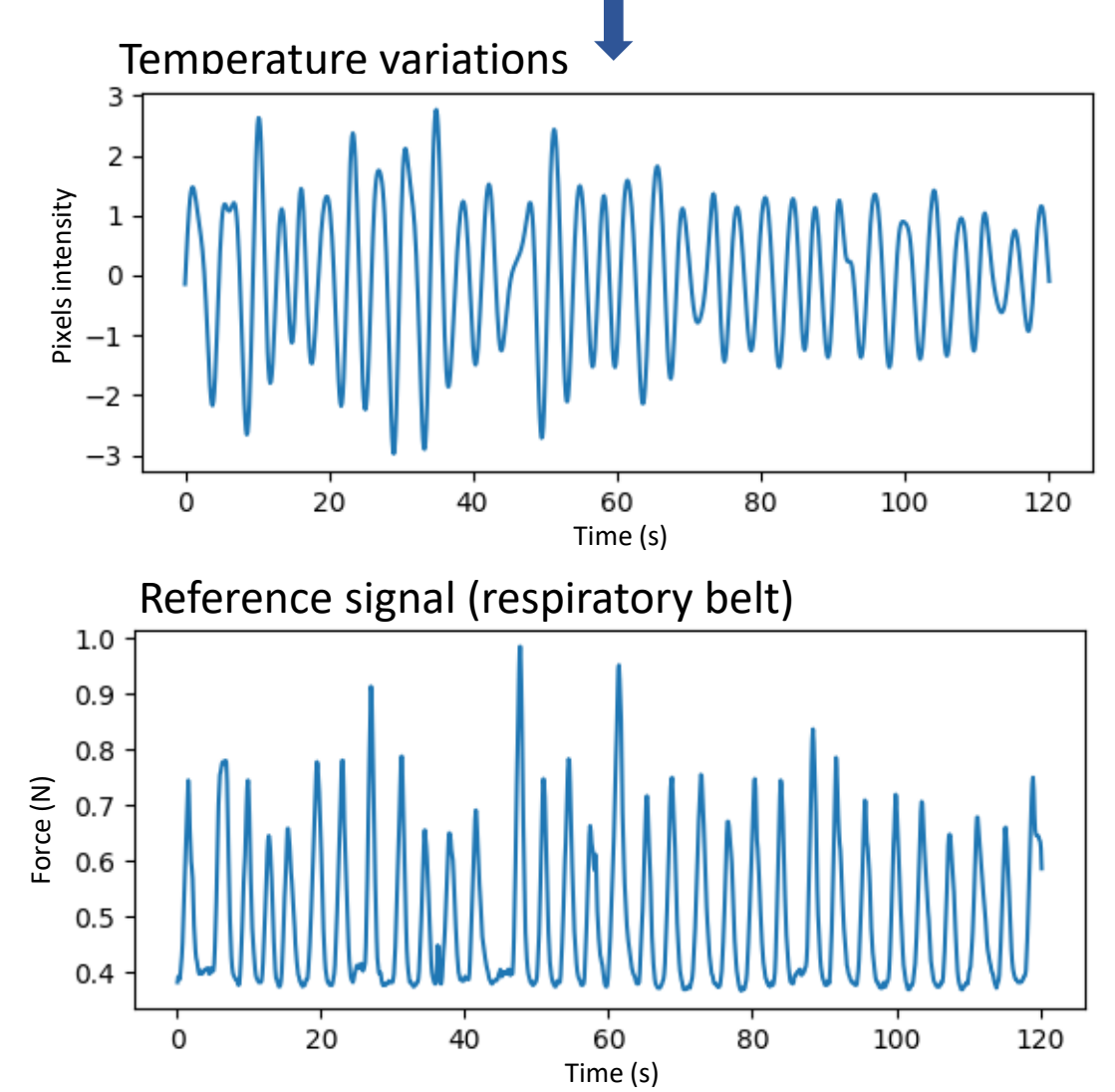
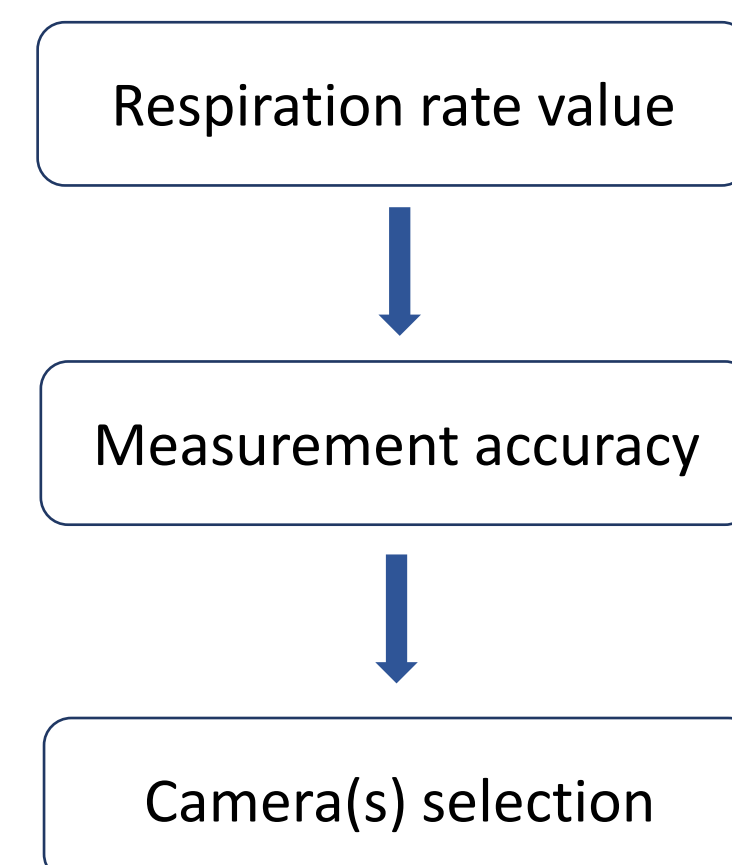
Thermal video of 1 camera:



Pixel classification:



Region of Interest:



**CONCLUSION:**

This study will deliver useful insight to build a reliable setup in a clinical environment.

[1] Lorato, I.; Stuijk, S.; Meftah, M.; Kommers, D.; Andriessen, P.; van Pul, C.; de Haan, G. Towards Continuous Camera-Based Respiration Monitoring in Infants. Sensors 2021, 21, 2268. <https://doi.org/10.3390/s21072268>