

Remote thermography for respiration rate monitoring

Citation for published version (APA):

Alves, R., van Meulen, F., van Gastel, M., Verkruysse, W., Overeem, S., Zinger, S., & Stuijk, S. (2022). *Remote thermography for respiration rate monitoring: a study into the optimal experimental setup*. Poster session presented at 8th International Hypothermia and Temperature Management Symposium 2022, Eindhoven, Netherlands.

Document status and date:

Published: 16/06/2022

Document Version:

Publisher's PDF, also known as Version of Record (includes final page, issue and volume numbers)

Please check the document version of this publication:

- A submitted manuscript is the version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher's website.
- The final author version and the galley proof are versions of the publication after peer review.
- The final published version features the final layout of the paper including the volume, issue and page numbers.

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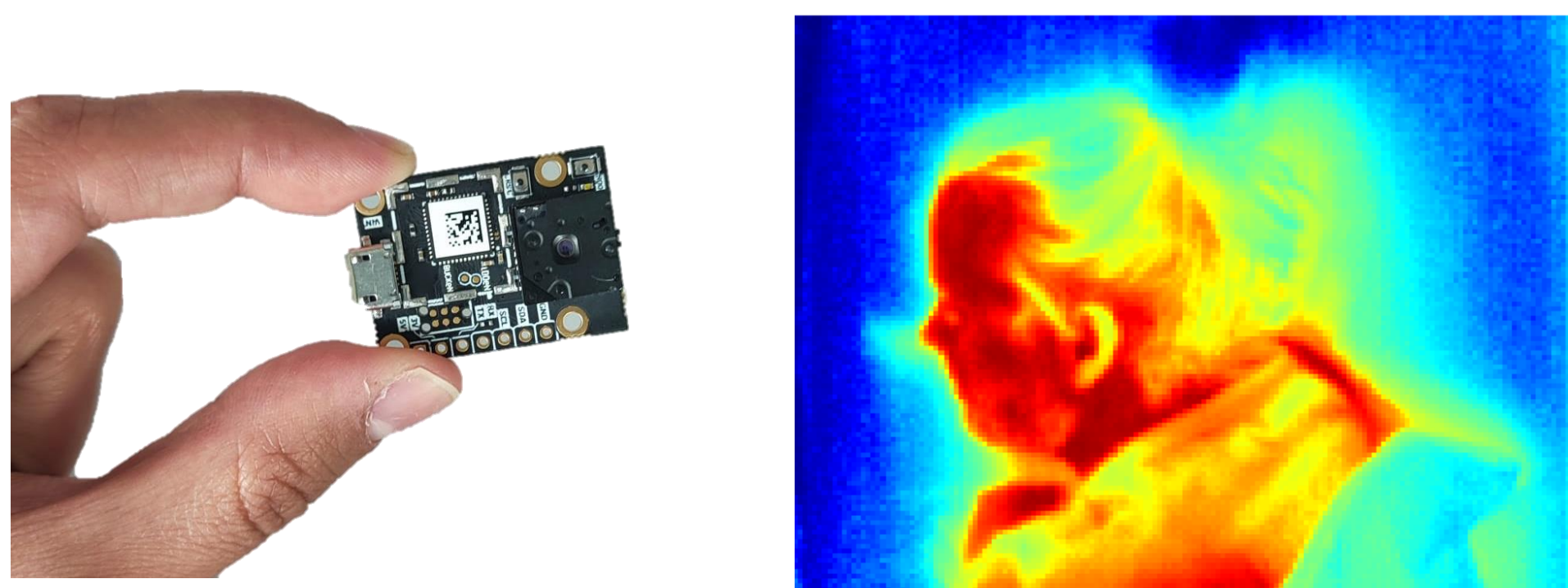
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Remote thermography for respiration rate monitoring: a study into the optimal experimental setup

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

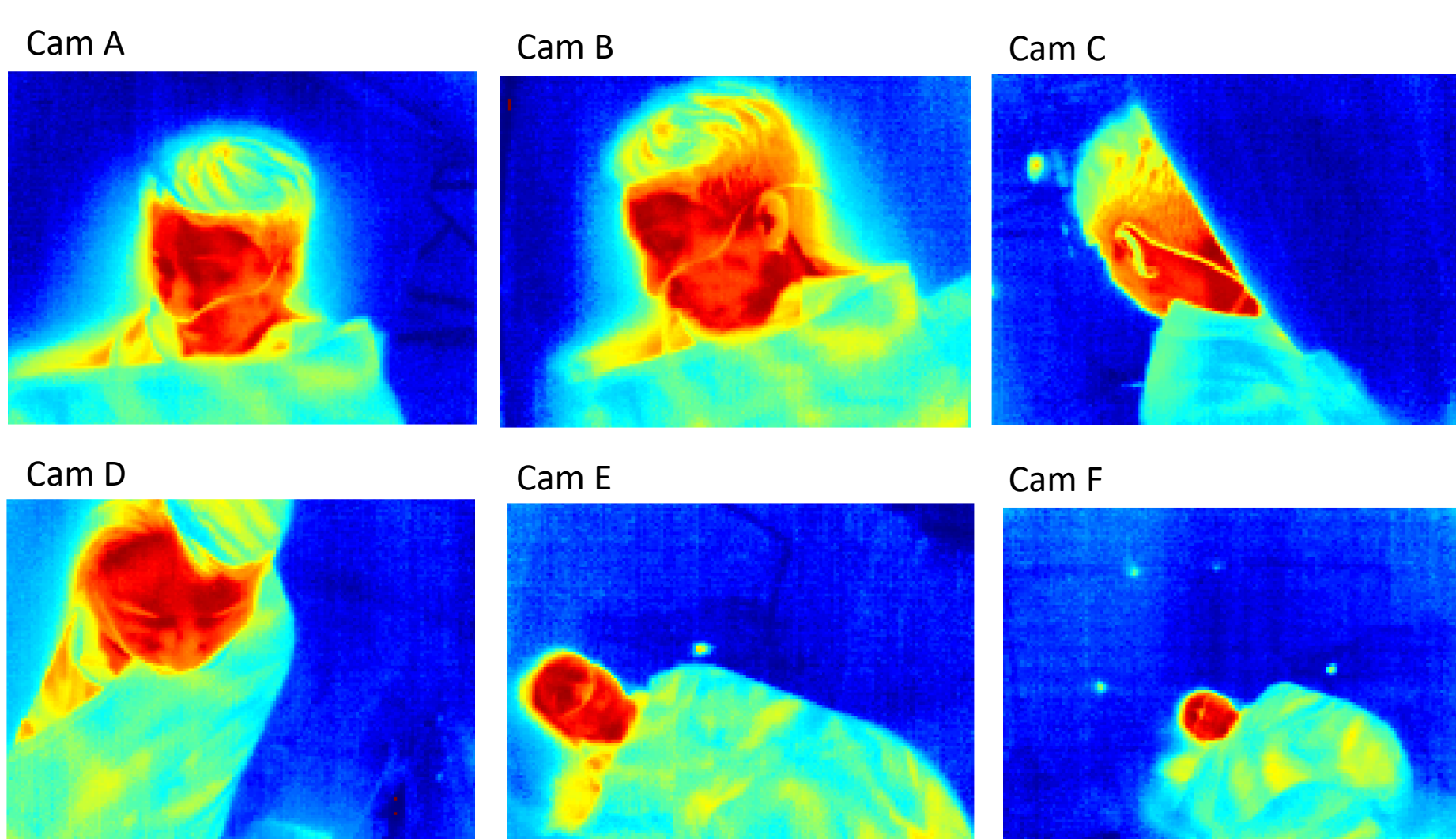
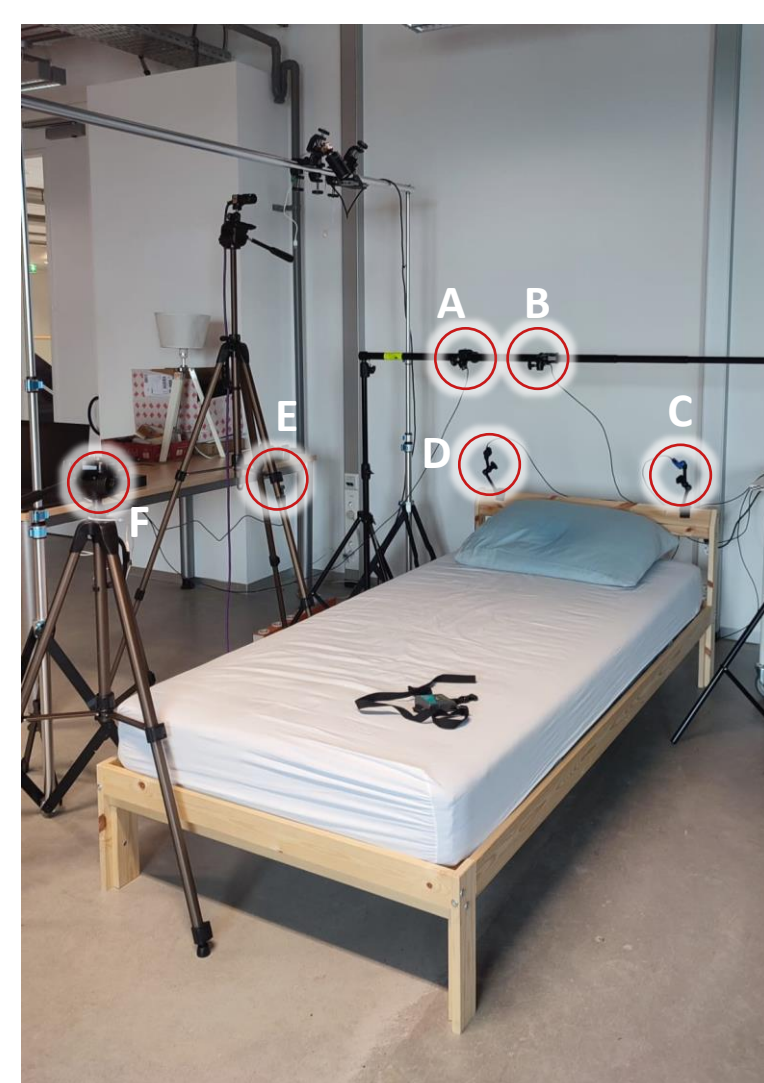
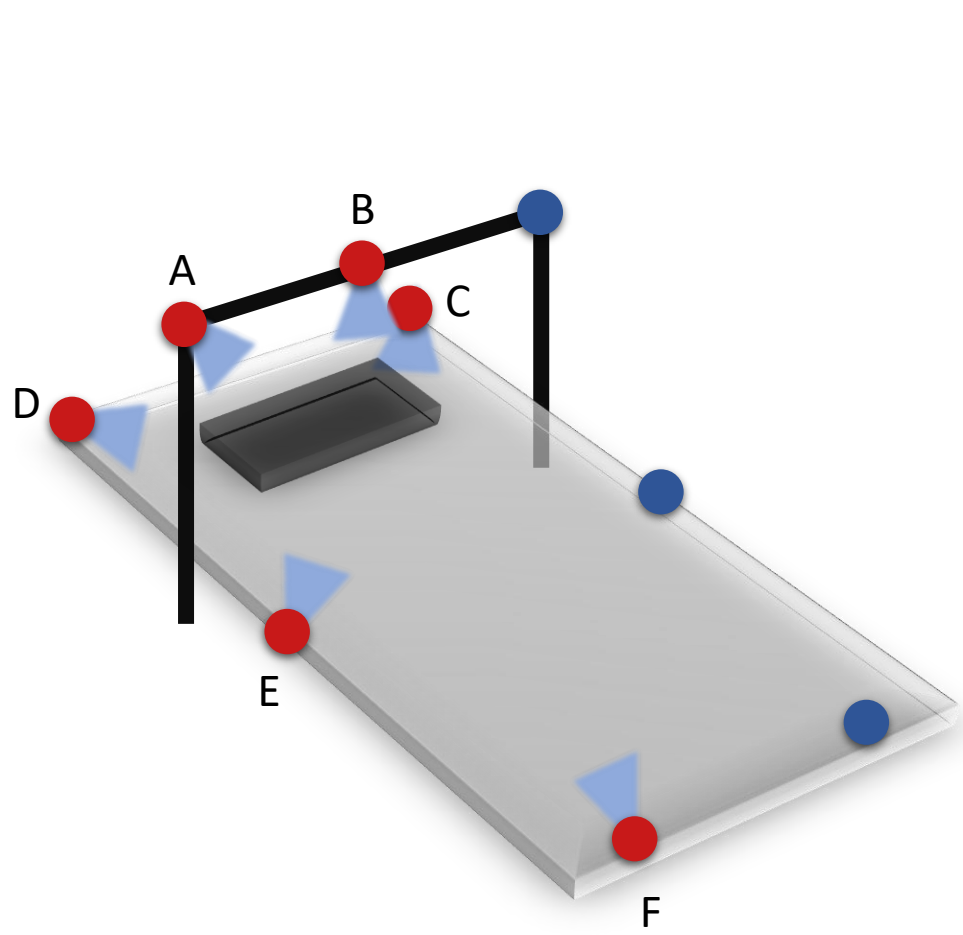
Thermal cameras can be used to monitor respiration flow and motion by detecting chest movements and temperature variations caused by breathing airflow, respectively [1]. We aim to apply this to unobtrusive monitoring of sleep apnea. Our solution will enable contactless monitoring and thereby remove the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

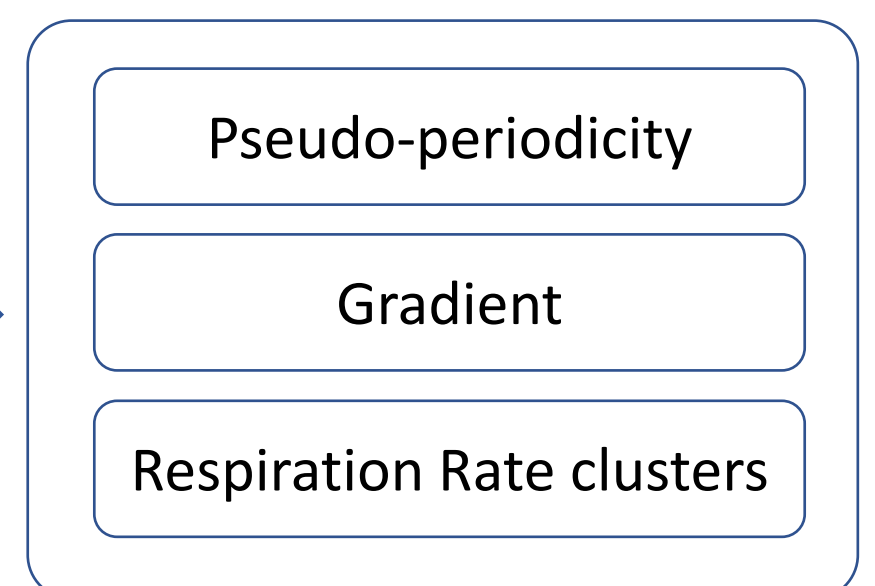
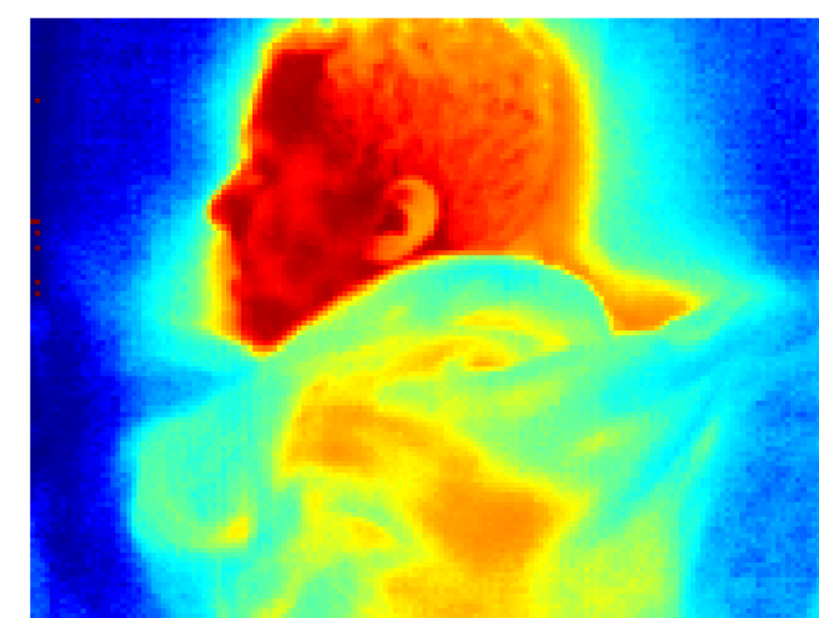
Experimental setup:



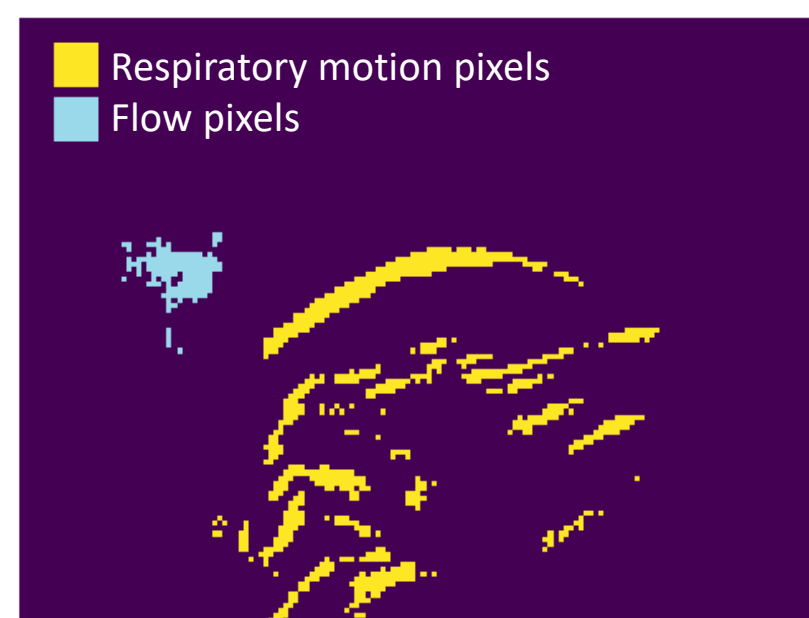
DATA PROCESSING:

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

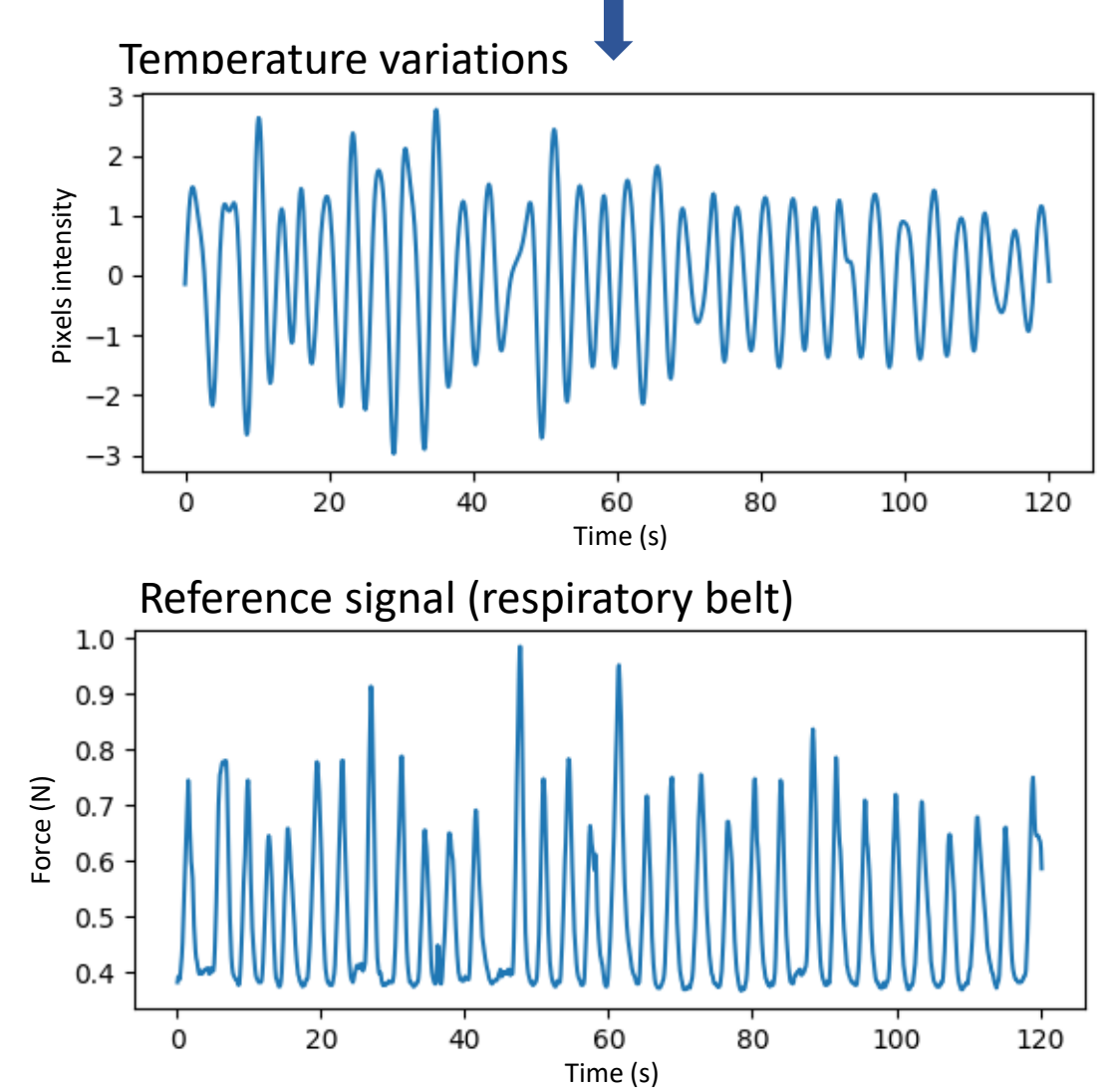
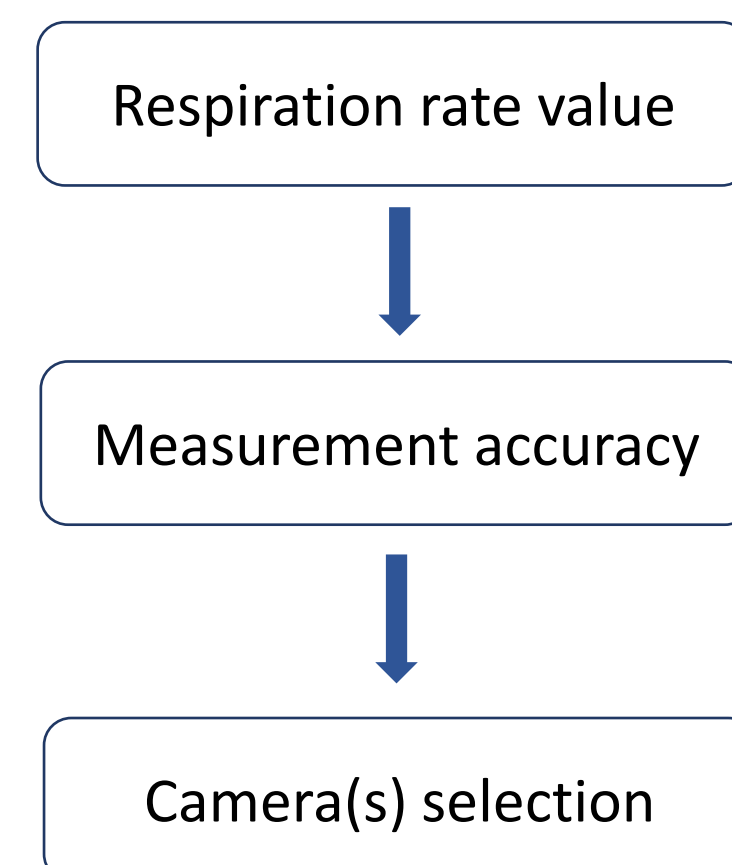
Thermal video of 1 camera:



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>