



Smartphone-based Cough and Sleep Quality Detection

Conference Poster

Author(s):

Barata, Filipe; Tinschert, Peter; Rassouli, Frank; Baty, Florent; Brutsche, Martin; Steurer-Stey, Claudia; Puhan, Milo; [Fleisch, Elgar](#) ; [Kowatsch, Tobias](#) 

Publication date:

2018-01-28

Permanent link:

<https://doi.org/10.3929/ethz-b-000221443>

Rights / license:

[Creative Commons Attribution-ShareAlike 4.0 International](#)

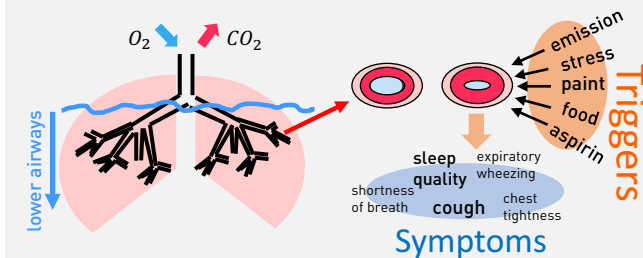
Originally published in:

<https://doi.org/10.13140/rg.2.2.34164.45441>

Smartphone-based Cough and Sleep Quality Detection

Filipe Barata¹, Peter Tinschert², Frank Rassouli³, Florent Baty³, Martin Brutsche³, Claudia Steurer-Stey^{4,5}, Milo Puhan⁴, Elgar Fleisch^{1,2} & Tobias Kowatsch²
¹ ETH Zurich, ² University of St.Gallen, ³ Cantonal Hospital St.Gallen, ⁴ University of Zurich & ⁵ medix Zurich

1. Problem



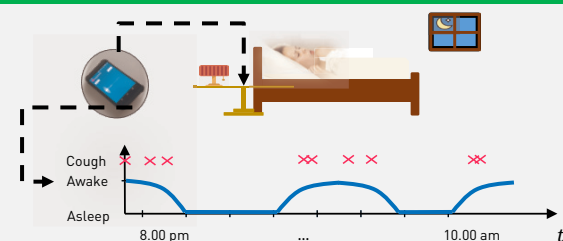
2. Research Question

To which degree of accuracy can a mobile application detect **asthmatic nocturnal cough** and **sleep quality** with the smartphone's built-in microphone?

3. Research Framework

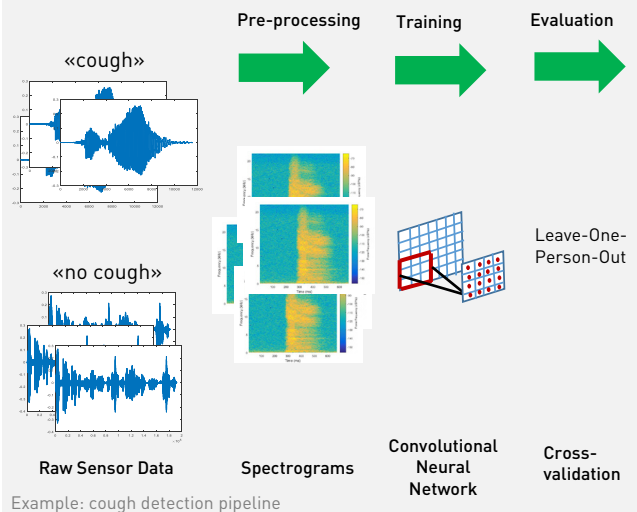
- Marsden et al. (2016): Nocturnal cough frequency provides an objective assessment of asthma symptoms that **correlates** with standard measures of **asthma control**
- Luyster et al. (2012): **Sleep quality is associated with asthma control** even if accounted for concomitant diseases

5. Expected Results



A classification model with accuracy values close to 1 for performing the cough detection and sleep quality estimation can be developed.

4. Method: Learning Pipeline



References

Barata, F., Kowatsch, T., Tinschert, P., Filler, A., Personal MobileCoach: Tailoring Behavioral Interventions to the Needs of Individual Participants, UbiComp '16 Proceedings of the 2016 ACM International Joint Conference on Pervasive and Ubiquitous Computing: Adjunct Workshop Designing, Developing, and Evaluating The Internet of Personal Health (IoPH), Heidelberg, Germany, 1089-1094.
Luyster, Faith S., et al. "Sleep quality and asthma control and quality of life in non-severe and severe asthma." *Sleep and Breathing* 16.4 (2012): 1129-1137.
Marsden, Paul A., et al. "Objective cough frequency, airway inflammation, and disease control in asthma." *CHEST Journal* 149.6 (2016): 1460-1466.
Tinschert, P., Barata, F., Kowatsch, T., Enhancing Asthma Control through IT: Design, Implementation and Planned Evaluation of the Mobile Asthma Companion, in Leimeister, J.M.; Brenner, W. (Hrsg.): Proceedings der 13th International Conference on Wirtschaftsinformatik (WI 2017), St. Gallen, 1291-1294.

Partner

Kantonsspital St.Gallen



University of Zurich UZH

medix gruppenpraxis