# **Comment:** Problem in title

# **Answer:** So we just have to relate how the detection of artifacts relate to the detection of stress

# 

# But could this require us changing the title? What if we don't change our title? Do we have to implement the annotation of stress detection? No we have to delimit it to detection of artifacts and somehow just relate how the detection of artifacts leads to the proper detection of stress. Ewan sa part na to

# 

# Or maybe this could require us to search how experts label EDA signals as stressed or not stressed

Taylor et al. (2015). When you feel an increase in stress, cognitive load, or emotion, your body will begin to sweat, causing you to produce a Skin Conductance Response (SCR) like the one pictured

EDA has frequently been used in studies related to affective phenomena and stress (e.g. [5], [6], [7], [8], [10], [12], [14]).

continuous and unobtrusive measurement of EDA using wearable devices makes the signal collected vulnerable to several types of noise. Artifacts can be generated from electronic noise or variation in the contact between the skin and the recording electrode caused by pressure, excessive movement, or adjustment of the device. If these artifacts remain in the signal when it is analyzed they can easily be misinterpreted and skew the analysis; for example, they may be mistaken for a skin conductance response (SCR) (a physiological reaction that may indicate increased stress).

Even though not without controversy [39], it is widely accepted that humans’ affective states and stress levels can be inferred from EDA measurements [3, 38]. This is because EDA is linked to the physiological arousal induced by the Sympathetic Nervous System (SNS) in response to humans’ distress or eustress [3].

The possibility to infer a person’s emotions and other “internal states” like cognitive load or distress is a fundamental premise towards the creation of ubiquitous computing systems that can “sense, interpret, adapt, and potentially respond appropriately to human emotion” [42].

Signal processing techniques – like, e.g., low-pass filtering [28, 37] – can be applied to avoid visual inspection. However, these approaches modify the entire EDA trace thereby distorting also genuine physiological responses [70] or, conversely, cause true artifacts to be transformed into genuine-looking data [35].

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[28] Javier Hernandez, Rob R Morris, and Rosalind W Picard. 2011. Call Center Stress Recognition with Person-specific Models. In International

Conference on Affective Computing and Intelligent Interaction (ACII 2011). Springer, 125–134.

[35] Malia Kelsey, Richard Vincent Palumbo, Alberto Urbaneja, Murat Akcakaya, Jeannie Huang, Ian R Kleckner, Lisa Feldman Barrett,

Karen S Quigley, Ervin Sejdic, and Matthew S Goodwin. 2017. Artifact Detection in Electrodermal Activity Using Sparse Recovery.

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102110D.

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IEEE, 53–58.

[70] Yuning Zhang, Maysam Haghdan, and Kevin S Xu. 2017. Unsupervised Motion Artifact Detection in Wrist-measured Electrodermal

Activity Data. arXiv preprint arXiv:1707.08287.

# 

# **Comment:** What is the output of the study? No output in the conceptual framework.

# **Answer:** Labeled signals of whether the signals are artifacts or not artifacts

# 

# **Comment:** How are you going to detect stress?

# **Answer:** The goal is not actually to detect stress but to detect artifacts that ultimately give other researchers the ability to label the signals as genuine stress, rather than have signals that are indeed artifacts/noise be mistaken for a genuine stress response in the form of skin conductance response (SCR). Taylor et al. (2015)

# 

# **Comment:** what are the features that say if a signal is an artifact or not an artifact?

# **Answer:** List the criteria needed to tell if a signal is an artifact or not. Because once these signals are labeled only then can feature engineering/extraction be applied. Ah Wait maybe what sir means by features is what are the criteria that say a signal is an artifact or not

# 

# In a study by Taylor et al. (2015), a signal is labeled an artifact if:

# - A peak which does not show exponential decay, depending on the context (e.g. if two SCRs occur close together in time, the first response may not decay before the second begins, yet this is not considered an artifact)

# - has a quantization error with ≥ 5% of signal amplitude

# - has a sudden change in EDA correlated with motion

# A SCL ≤ 0

# 

# **Comment:** No related study for theoretical framework?

# **Answer:** So this must be based on the other benchmark studies and not solely based on our own idea of the framework, so we have to place llanes-jurado et al. framework instead and remove the lstm-svm part since the whole point of TF is to be able to use it as basis or guide for our system architecture. So what we initially created as our TF we place now in our system architecture. We also need to cite the study our theoretical framework was based on which are from llanes-jurado et al. (2023).

# 

# **Comment:** Specify the models found in SOP2 in SOP1

# **Answer:** specify the models in sop1 i.e. rf, gbt, lstm-cnn

# 

# **Comment:** clarify the input and output variables and process. Include "labeled artifacts" in output.

**To do:**

* Add here other statements from Gashi et al. (2020) paper citing how detection of artifacts can lead to proper detection of stress
* Add here other statements from Hossain et al. (2022) paper citing how detection of artifacts can lead to proper detection of stress
* Add here the methodologies and processes involved in Gashi et al. (2020) paper how they labeled artifacts since this is what sir Montaigne asks of

# 

# 

# 

# 

# **CHAPTER 1**

# **INTRODUCTION**