

# Detection and coping suggestions for exam anxiety based on 24/7 unobtrusive biometrical monitoring

## INTRODUCTION

The negative side effects of chronic psychological stress are widely known. Studying as an early source of work-related stress was examined by questionnaire-based research before. Becoming accustomed to self-responsible healthy and effective coping techniques during the earliest stage of their professional life would give students a chance for maintaining a better health during their lives – a foundation for advancement and success and for causing less cost in health care.

## APPROACH

- 1) Detection of temporarily changes in psychological tension, based on HRV

Heart rate variability (HRV) is a biometrical parameter for autonomous nervous system activity used to examine the characteristics of acute and also chronic stress. It is chosen above the more exact EEG because of the invisibility of the measurement hardware during daily life, making it first choice for constant (24/7) personal monitoring.

- a) Exploratory Data Analysis

24h HRV measurement data and a protocol of subjective felt tension was collected by (in)direct observation of voluntary subjects. Anonymity was preserved by unsupervised return of all data collection devices.

- Evaluation of 24h measurement data for consistency with results derived from clinical ECG measurements
- Evaluation for changes appearing during impromptu changes (minor accident, fright) in comparison to long-term changes (stressful situations)
- Statistical modeling based on both general and individual parameters (Mixed effects models)

- b) Development of a signaling algorithm for anxiety or tension induced changes in underlying dynamics

- 2) Statistical analysis of different groups of examination candidates

To find out if and to which degree certain coping techniques affect severity of exam anxiety, different forms of stress relieving interventions as well as examination candidates in different fields of personal and professional expertise are compared.

- a) Comparison of student groups practicing either none or a body- or mind based form of stress relieving method like yoga or meditation
- b) For investigation if a healthy lifestyle and constant practice of yoga inflicts any changes inefficiency of coping mechanisms, a group of yoga instructors in training are monitored before and during their final examination (written, 4 hours)

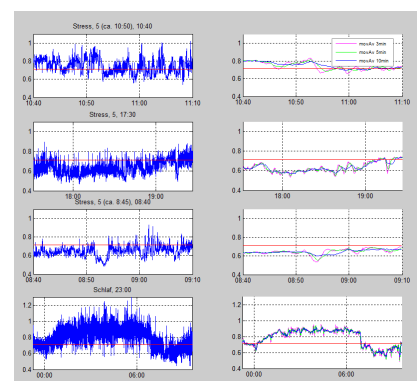
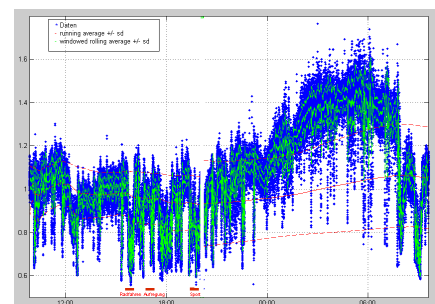
- 3) Application development

Goal is the development of a Smartphone application usable in daily life, e.g. the week before an examination takes place.

Field of application will be discreet constant monitoring of HR during periods of known stress (examination preparation), giving an intervention signal and recommendation whenever levels of anxiety rise too high.



Measurements are gained by Polar TeamPro ChestStrap / HR recorder Hardware, chosen for accuracy (sampling frequency > 1000Hz) as well as its long-time-recording and wireless communication capacities



Beispiele für die Veränderung der HR unter Stresseinfluss

