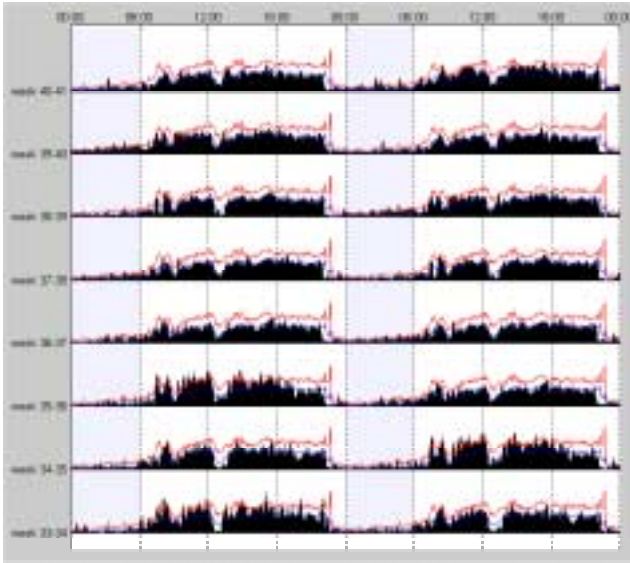


## IST Vivago® : Case studies based on the activity signal

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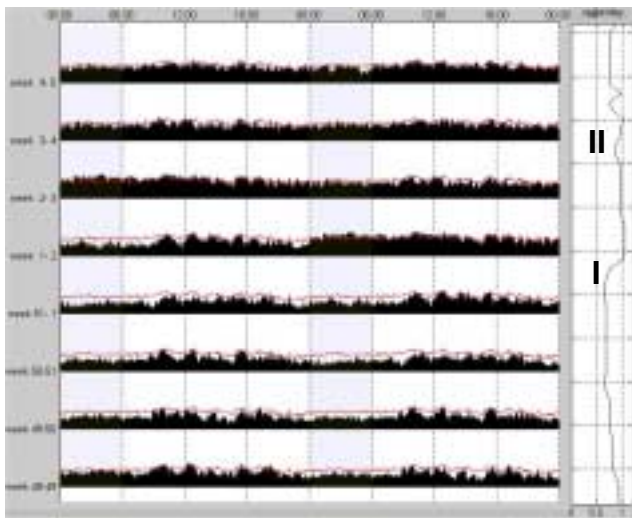
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### Case 1. Normal, good circadian rhythm.

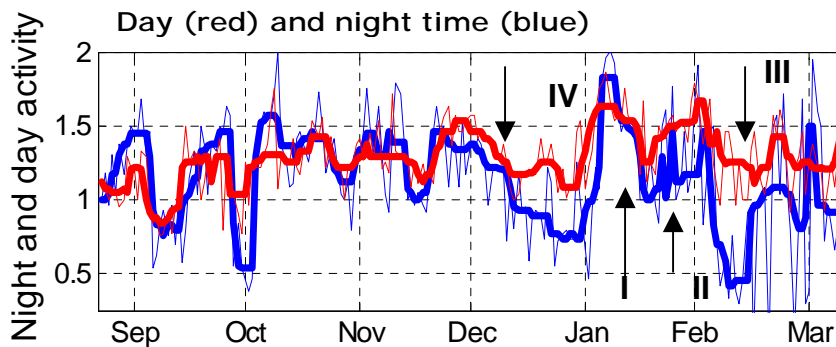


- 84- year old woman, mild memory disorders, MMSE score 21 and CDR class 0.5.
- Good functional capacity, Barthel score 90.
- No diseases, uses tranquilizers.
- Generally sleeps well and feels good.
- Clear circadian rhythm visible in the activity signal, low night time activity indicates good sleep, daily naps after lunch.

### Case 2. Changes in health status are visible in the night time activity level and the ratio of night and day activities (curve on the right side of the graph).



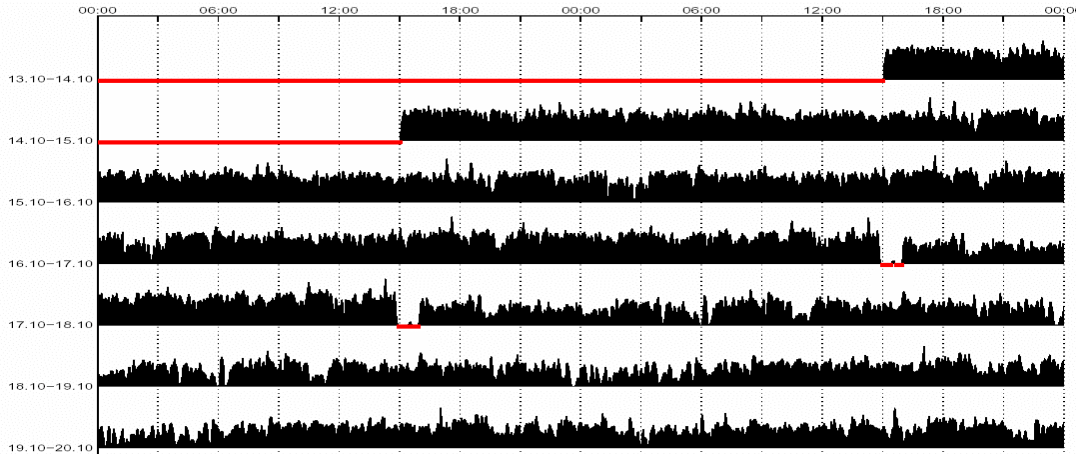
- 83- year old woman, basic disease Myasthenia gravis.
- Functional capacity poor because of the basic disease, Barthel score 45.
- No dementia, mild memory disorders, MMSE score 23, CDR class 0.5.
- During winter several acute diseases:
  - Diagnosis of an urinary track infection on 15.1.2003, activity curve shows a change in the ratio of day and night time activities prior to the diagnosis (I).
  - Fever on 25. - 27.01.2003 -> diagnosis of bronchitis on 30.1.2003 (II), night time activity has risen prior to the diagnosis. After recovery, the activity curve shows better daily rhythm (night time activity drops clearly below day time activity) (III).



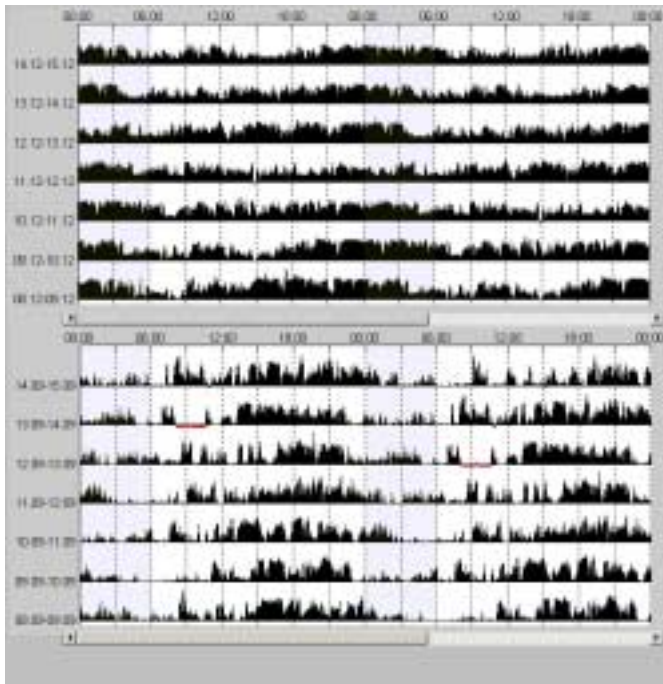
General condition becomes worse during spring 2003, hospitalized in early April 2003.

The restless room mate moves to another room in early December. This causes night time activity to drop, which improves the daily rhythm for some weeks in December (IV).

**Case 3.** The activity curve of a demented person: no circadian rhythm, activity continuously at a high level.

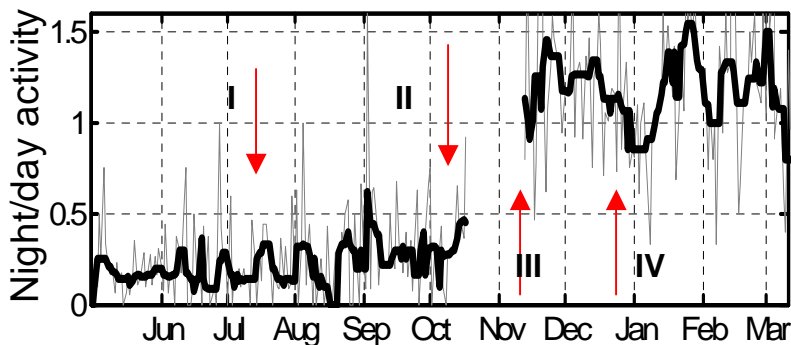


**Case 4.**



- 86- year old woman, coronary heart disease, cardiac insufficiency, and asthma. Poor functional capacity, Barthel score 20.
- Vascular dementia, MMSE score 20 and CDR class 1. Dementia advances during winter, MMSE score 15 in March 2003.
- Good circadian rhythm during the past year (I), hospitalized 15<sup>th</sup> of October because of the cardiac insufficiency and increasing pulmonary symptoms (II).
- Returns from the hospital on 11<sup>th</sup> of November (III), still in bad condition, sleeps poorly, tired during the day. The ratio of day and night activities shows bad or even reversed circadian rhythm (ratio close to 1).
- On 10<sup>th</sup> of December the cardiac insufficiency gets worse (IV), after this episode the night and day activity ratio temporarily improves (<1).
- General condition weakens during winter, dementia advances, tired and fatigue, sleeps poorly. A few occasional better days.

Ratio of the night and day time



### Conclusions

Based on the results of the study, the activity signal may describe changes in health status in both the worse and better directions. The health records and the circadian rhythm derived from the signal often support each other very well. The results suggest that the signal may be used to monitor changes in health status and to follow up on the effects of treatment in elderly care institutions, and hence to support nursing practises.