

8 Conclusions

Pervasive technology has been identified as a strong asset for achieving the goal of a user-centred preventive healthcare [148]. Moreover, pervasive healthcare technologies offer new opportunities beyond traditional disease treatment and may play a major role in the management of chronic patients in their own environment, thus increasing their quality of life by staying in a familiar environment and reducing healthcare costs.

The challenges related to this topic are addressed in this thesis were:

- i) the design of new strategies for patient training;
- ii) collecting evidence that wearable technology, associated with data recorded during daily life, is a valuable resource to gain insight in patient conditions;
- iii) the development of unsupervised methodologies for patient monitoring that may be used as input to motivate active behaviour;
- iv) the development of unobtrusive diagnostic support systems able to detect early stages of the disease with the smallest burden for the patient.

The general conclusions are:

- The widespread adoption of smartphones provides a platform for healthcare applications that is directly available to patients. It has been shown that it is a mature technology that could be used as part of clinical routine and daily life monitoring. Future works should aim at creating clinically validated applications running on smartphones to be used also in countries under development where, paradoxically, there is a high economic burden, but a sudden growth of smartphone users. Although, we may consider smartphones not suitable for the current old patient populations, we need to consider that the next generation of chronic patients will be familiar with these technologies.
- Physical activity outcome measures assessed during daily life need to be clearly delineated when evaluating and designing interventions aiming at promoting physical activity in patients with COPD. Based on the results of this research, it is clear that different group of patients with different physical activity patterns exists. They need to be clearly individuated in order to tailor physical activity enhancement interventions. For example, decreasing the time in very light intensity without necessarily increasing the time in moderate-to-vigorous for group of patients that spend enough time in moderate to vigorous activities would mean focusing on light intensity activities. Reductions in sedentary time by increases in light activities might be more realistic for patients with COPD, which in fact could help paving the way to posterior increases in the time in more intense activities. These assumptions should be anyway confirmed in randomized controlled trial intervention studies.
- Identifying groups with specific sleep characteristics may be another source of useful information when designing physical activity enhancing interventions with