Opportunities for Smart & Tailored Activity Coaching

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CONCLUSION
We have identified six areas where smart technologies can be applied to tailor various aspects of an individualized activity coach. Location-aware activity-type sensing (1) and self-learning individual goal setting algorithms (2) should form the basis for providing awareness of physical activity as well as obtainable goals. The generation of motivational messages can benefit from complex pattern analysis to determine an optimal timing (3) and content (4) of messages for the user in his current context. Language generation tools can alleviate the problem of repetitiveness in natural language interaction between user and coach. The presentation of an intelligent coach can use advanced HCI methods — e.g. the use of ECA’s (5) — that can migrate with the user through various devices in order to optimally use the available interaction resources at the user’s current location (6).

ABSTRACT
The application of smart tailoring techniques has potential to increase the adherence to — and consequently the effectiveness of — individualized healthcare technology based interventions. Ambulant physical activity coaching is currently attracting great interest in the scientific community, but tailoring in this field is as yet relatively unexplored. We present the results of a structured analysis of available tailoring methods in the form of a model, and provide a short overview of the state of the art. Based on the gaps in the literature, we have identified six key areas in which emerging smart technologies can be applied to create the next generation, intelligent and individualized activity coach.

THE MODEL
The model defines the following concepts:

- Two motivation strategies: general tailoring strategies to motivate physical activities.
- Three static tailoring techniques: basic tools that can be used to modify the intention, timing, content or representation of a communication.
- One dynamic tailoring technique: Self Learning, that can be used to augment the static tailoring techniques through adaptation to the user over time.

KEY AREAS FOR IMPROVEMENT
Combined with research into emerging smart technologies as well as our many years of experience in deploying physical activity coaching systems to various patient populations, we have identified opportunities for future research directions in six key areas related to activity coaching. These key areas are 1) Smart Sensing, 2) Adaptive Goal Setting, 3) Adaptive Reminding, 4) Personalized Message Generation, 5) Advanced HCI, and 6) Pervasive Coaching.

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