

# When 'smart' apps become smart for real

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Esteban Guerrero, doctoral student at the Department of Computing Science, Umeå University in Sweden. Credit: Umea University

How can a smart application recognise and reason about a human's purposeful activities in order to be able to coach in a purposeful way?

Esteban Guerrero at Umeå University in Sweden presents new computer-based methods for this that are based on activity-centric and argument-based theories.

In daily life humans evaluate his or her activities based on more or less explicit information. A skier uses information about arm- and leg movements, distance, environment, etc. based on the goals the person has set up. But there are also factors that affect that are less explicit, such as the motives behind improving health, social inclusion, etc.

Esteban Guerrero's research was aimed at developing theories and methods that include also complex factors in the computations of capacity and performance. When more complex factors are included, the methods need to handle uncertainty and changing conditions.

By using and developing theories based on human activity and reasoning such as activity theory and argumentation theory, different interpretations of a situation can be generated and evaluated, and adjusted when new information is collected, and this in a way that the human recognises and can participate in.

Esteban Guerrero has taken a starting point in assessment methods used by therapists, among other an instrument for measuring balance and strength in [older adults](#) for preventing falls, and developed new generic methods that a computer system can use. These methods build on activity-theoretical models of [human activity](#) and on new-developed argumentation-theoretical frameworks.

The methods were implemented in mobile apps that have been tested among other older adults, for the purpose to evaluate capacity and performance in exercises that aim at measuring different aspects of strength and balance. This was done in collaboration with physiotherapists at the department of Community Medicine and

Rehabilitation at Umeå University.

"The methods could be used in for instance "smart homes", for example diagnosis and treatment apps that the person can use at home, or an app measuring and evaluating balance and strength for preventing falls in older adults", Esteban Guerrero says.

Esteban Guerrero has performed his graduate studies within the User, Interaction and Knowledge Modelling research group at the Department of Computing Science at Umeå University.

**More information:** [umu.diva-portal.org/smash/record.jsf?pid=diva2%3A927778&dswid=newPopUp](http://umu.diva-portal.org/smash/record.jsf?pid=diva2%3A927778&dswid=newPopUp)

Provided by Umea University

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