*X. Parra-Llanas, A. Rodriguez-Molinero, C. Raya. Automatic measurement of elderly people's spatial gait parameters using computer vision. Gerontechnology 2008; 7(2):185.*
Normal aging is characterized by functional changes that affect several motor tasks including postural balance and gait. Step length variability has been suggested to be an important predictor of the risk of falling[1]: the age-related increased variability may result of errors in the control of foot placement and/or center of mass displacement. Stride width has been suggested to be a discriminator of fallers[2]: side-fallers, who have narrower stride widths compared to those who fall in other directions, may not be adapting their gait to compensate for lateral instability. In any gait analysis study, spatial characteristics of the gait are collected (for instance, step length, stride length, step width). In many cases, these parameters are collected using computerized dynamic posturography. However, the use requirements of these devices make difficult the accomplishment of extensive and ambulatory population studies. The CAALYX project (Complete Assisted Living Experiment – financed by the European Commission) is involved in an ambulatory study to characterize, among other physiological parameters (including temperature, blood pressure, etc.), the spatio-temporal gait parameters of the elderly in an extensive area (such as Spain). The number of elderly people implied in the study surpasses the 800 and are distributed in a geographic area equivalent to the one of a country (for instance, Spain). In this case the use of expensive posturography equipments has been discarded, so a non-expensive and ambulatory but efficient method is necessary. **Methods** With the purpose of measuring the spatial gait parameters, the footsteps of elderly people walking have been stamped on paper using black ink. Later the impression of the steps on the paper has been digitized, obtaining an image like the one shown in Figure 1. The image obtained is processed applying techniques of computer vision. In a first phase, the steps printed are detected and later the measures that characterize these steps (including step and stride length, lateral and medial step width, etc.) are automatically extracted and registered for the actual sample. Finally, the original image is augmented with additional graphical information (for instance, bounding box of the step, centroid, inner-lateral direction line, etc.). **Results and discussion** Figure 1 shows the graphical information obtained for a single walking sample. Numerical information related to the parameters measured is stored for later processing and analysis (e.g. gait variability or population categorization). The method implemented is robust because all the steps are always processed. At the moment, the efficiency of the method is under study to properly validate that the measures obtained adjust to the real measures.

**References**

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2. Ko S-U, Gunter KB, Costello M, Aum H, MacDonald S, White KN, Snow CM, Hayes WC. Journal of Aging and Health 2007;19: 200-212

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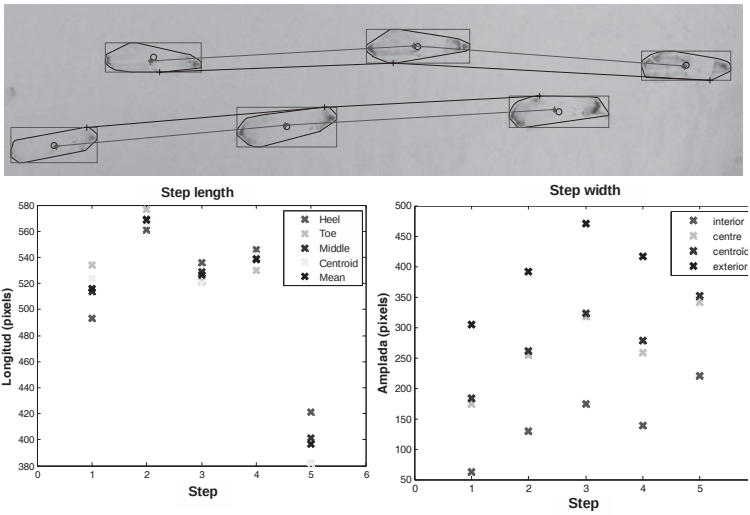


*Figure 1 Walking sample and step length and width measures*