Tesi su proposta

ACTISPORT, Running Recognition Algorithm for Activity Monitoring of
Sportspersons during Training and Rehabilitation

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Place of development: NIB Universidad de la República, Uruguay

Timing: 1 month preparation in Torino & 5 months at NIB, prior to defense in POLITO July 2020

The Politecnico di Torino has developed an original instrument, ACTIGRAFO, presently commercialized by Medical Technology SRL, also responsible for the manufacturing and distribution of STEP32, a statistical gait analysis system. ACTIGRAFO has the ability to recognize and classify standing, sitting, walking and climbing as well as going down the stairs during several days of normal life of a person. This is important in the follow up of chronic patients as well as during guided rehabilitation, e.g. after stroke or surgery. Sports Medicine is also interested to objectively quantify exercise during training and to keep a documentation of its evolution over days in order to fulfill performance goals.

ACTISPORT includes the simplified approach of movement analysis of the lower limb extrapolated to the analysis of data gathered during mixed periods of rest, quiet gait and intensive training, predominantly running but also stereotyped movements in the football field. A series of predefined exercises are recorded from sportspersons and an automatic detection of such exercises is to be developed. The result of application of the algorithm to the acquired signals is to be compared with the actual exercises performed, until validating is reached. The data gathering session with a summary of activities detected over time is made available by ACTISPORT as a CDA format file for the ECR

The "laurea magistrale" thesis starts with the study of previous instruments STEP 32 as well as ACTIGRAFO at POLITO and CUENTARADIO at NIB. Then the student will analyze the problem leading to a detailed specifying of ACTISPORT including inertial sensors as building blocks. Work follows with the design of the research protocol for sportspersons in training follows under the tutorship of Sports Medicine Physician, with subsequent data gathering and analysis. Development and fine tuning of the classification algorithm with subsequent programming along the technological lines of ACTIGRAFO. Software for a comprehensive report for the ECR is developed and tried, prior to documentation and final testing, then the writing of a paper and the preparation of the thesis.