# Sport DB 2.0: a New Database of Data Acquired by Wearable and Portable Devices while Practicing Sport

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Sport is usually recommended for its beneficial effects on health. Rarely, it may also trigger acute cardiac events that may degenerate in sport-related sudden cardiac death, even in subjects with unknown cardiac conditions. Thus, understanding the hidden cardiac mechanisms occurring during sport that may lead to cardiac complications is crucial. Sport DB 2.0 is a new database including 708 datasets (582 completely new and 126 already present in the already published Sport DB database) of data acquired through wearable and portable devices from 182 subjects (Fig.1) while practicing 15 different sport disciplines (aerial silks, basketball, CrossFit, fitness, jogging, middle-distance running, running, soccer, tennis, Zumba, cycling, American football, trekking, athletics, speed skating) during training or competitions. All subjects gave their informed consent prior to data collection. Each dataset consists of demographic and anthropometric data (sex, age, weight, height, and smoking habit), cardio-respiratory signals (electrocardiogram, heart-rate series, RR-interval series and breathing-rate series) and exercise data (weekly training rate, sport-dependent training protocol, and caffeine, alcohol and dietary supplement consumption). Demographic and anthropometric data were collected by survey and organized in text files. Cardiac signals were acquired through chest strap BioHarness 3.0 by Zephyr, KardiaMobile by AliveCor, Kardia 6L by AliveCor, Polar M400 and heart-rate sensor H7, and organized as MATLAB structures. Sport DB 2.0 may be useful to support research activity finalized to: 1) investigate cardiac mechanisms triggered by sport; 2) develop automatic algorithms for monitoring athletes' health while practicing sports; 3) validate reliability of wearable and portable devices in sport.
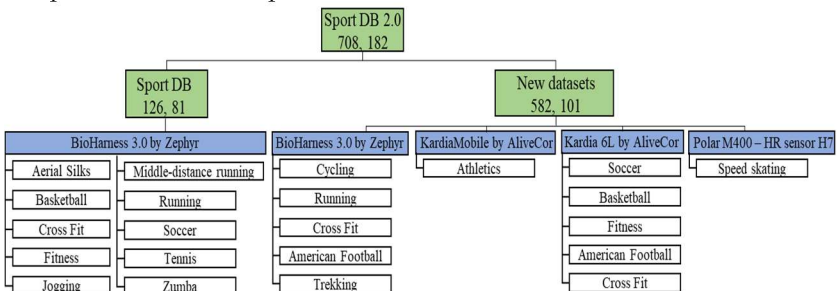


Figure 1: Structure of Sport DB 2.0 database. N,S indicates the number of datasets and the number of subjects, respectively.