Running is a sport involving cyclical movements that generate numerous impacts. Inadequate equipment and poor technique may limit performance and create injury risk. Can a runner’s gait be analyzed in order to detect the movements that create risk?

The Run Up project involves developing a system of sensors within a box that can be attached to a runner’s shoe, as well as associated algorithms that help measure the spatio-temporal parameters of running. EPFL’s Laboratory of Movement Analysis and Measurement (LMAM) uses its metrology and biomechanics expertise to obtain precise values, correcting for the inevitable sensor errors by modeling the running movement. The algorithms produce reliable, objective information that can be directly interpreted by the runner or their coach. The system allows measurements to be made in real race conditions, while outputting information equivalent to those obtained in a research laboratory. This approach is being applied to running, a fast-growing sport, but may ultimately be used in other activities as well.