

# Mathematical Modelling in Life Sciences and Technology

## The modelling of urban races

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We model a 10km urban race of about 10000 runners taking in consideration several conditioning factors. The main goal is to find ideal configurations of the start of the race, splitting it into several waves, reducing the density of athletes and the overall time lost, when comparing the normal race results with a race without density constraints. This model takes into account distinct realistic runners' profiles, changes in slope and width on the race track and its influence on the runners pace and the density levels, the dynamics of the start of the race and also the time between the departure of waves.