

## Distribution characteristics of position data of players in soccer game

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In football, group sport skills have been only analyzed by an expert's visual confirmation method until now. Therefore, the development of quantitative evaluation criteria of group sport skills is a subject should be settled as soon as possible. Also, it has been considered that there is an important relationship group sport skills and player's spatial arrangement, also, various references have been made to the spatial arrangement in order to strengthen the team in the coaching field. Based on these backgrounds, each attack scene is classified in two models the attack was fulfilled and the attack was failed, also, the changes of feature

value consisting of the position of the player is symbolized in each model. In this study, the feature value was considered to be data-series generated by the change in position of the ball, machine learning by Hidden Markov Models (HMMs) that position of the ball was assumed as the initial value of the state variable was made. As a result, it became clear that each model can be identified from the feature value and there is a difference between models with respect to the distribution of feature value in the each state. From these results, validity to develop evaluation criteria on the position of the player are suggested.