An Imaging System and Cycling
—Toward Sports Analysis for Cycling from Image—

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Abstract In the Olympic Games, cycling carried out from the 1st Athens conventions in 1896 is a history game. Japan has gained one silver medal and three bronze medals in the Olympic Games. Kerin was added to the item of track race from the 27th Sydney conventions in 2000. The Keirin which originated in Japan is the deep game of concordance for Japan. In the 2012 latest London conventions, road race, Track race, MTB (Mountain bike), and BMX (Bicycle Motocross) were carried out.

Establishment of cornering work for the Japanese player towards July 30 of the Tokyo Olympic Games in 2020 is one of the important factors. This paper describes the research on the image analysis for such a bicycle race. We have studied on Track race. There are Sprint, Team Sprint, Keirin, Team Pursuit, and Omnium in Track race. The Cornering work is in one of the points when conducting these analyses. Each corner is a bank (cant).

It is important for an athlete to play a game advantageously. For this purpose, the technical acquisition for using effectively the energy obtained from a bank is indispensable. The analysis using Potential and kinetic energy based on a physical law, endurance exercise performance based on sports science, etc. can be considered. However, generally there is nothing that was clarified including the established theory.

The purpose of this research is to clarify the condition of the athlete in cornering by image analysis. First, an video-data is obtained using some cameras. And an athlete's viewpoint video is also captured using an action camera. Next, both a run locus and the bank angle of a bicycle are estimated by analysing the captured videos. In order to perform this calculation, the physical sensor is taken together. And cornering is modeled. By this modeling, information while running a bank from an image is estimated.

A sports coaching by these data is important. For the performance improvement of an athlete, it is indispensable to join the information obtained from this research to the knowledge of sports science and the coaching.

Keyword Sports, Analysis, Cycling, Tokyo Olympic Paralympics.