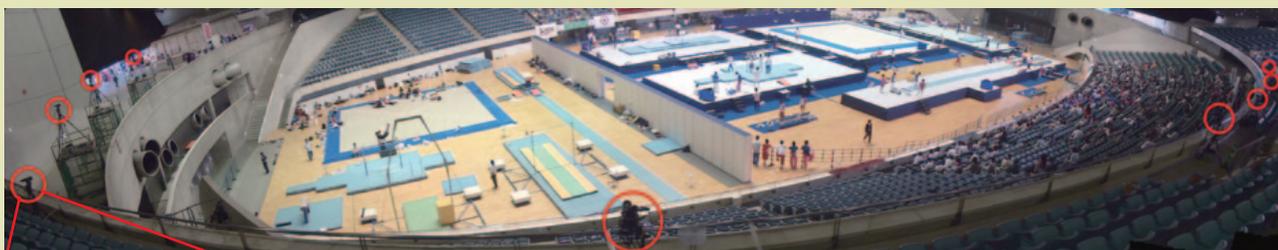


STRL's Research Results Applied to Sports Relay Broadcasts -At the NHK Cup International Gymnastics Tournament

Multi-viewpoint Robotic Camera System

STRL is developing a multi-viewpoint robotic camera system capable of shooting dynamic images that move in time with the movements of the subject. Multi-viewpoint video is a type of video where a subject is shot using multiple cameras installed at different locations. By placing multiple cameras around a subject, such as an athlete in motion, a new style of video expression is realized, "time slice views," that conveys to viewers the experience of moving in unison with the subject from the cameras' view. This is accomplished by sequentially switching between images that were simultaneously acquired by the surrounding cameras. We recently realized "time slice views" from any position around a moving athlete, which was not feasible in the past, through the interlocking control of nine robotic cameras.

The first application of this system was at the 52nd NHK Cup International Gymnastics Tournament, which was broadcast on Sunday, June 9, 2013. The system made it possible to show greater detail and express more clearly the athletes' movements and positions on the men's parallel bars and horizontal bar and the women's uneven parallel bars, and it revealed movements that would have been difficult to distinguish in single viewpoint video.



Shooting overview for the Yoyogi 1st Gymnasium (robotic cameras are circled in red)



Time slice views of E difficulty level "Makuts" on the parallel bars by Kouhei Uchimura.

Millimeter-wave mobile camera

This tournament included six simultaneous gymnastic events for men and women. Using conventional cabled cameras to cover the movements of the athletes around the small spaces between the event areas would have interfered with the competitions, so the broadcast also employed two wireless millimeter-wave mobile cameras developed by STRL. These wireless cameras captured realistic gymnastics performances and the emotions and expressions of the athletes after each performance. Particularly evident was the tension they felt while waiting for their scores to be announced.

A newly developed radio link quality analyzer for millimeter-wave radio broadcasts made it possible to easily monitor the propagation character of each camera and led to more stable operation.

We will continue to develop new applications in sports programming beyond gymnastics and enhance the multi-viewpoint system's performance.



Millimeter-wave mobile camera