SPQR SPL Team
Open Research Challenge
RoboCup 2019

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Description Gesture-based communication is a crucial mean of communication in regular human soccer games that enables efficient exchange of information among teammates. Moreover, signaling performed with hands and arms are the most used. Hence, in the Open Research Challenge, SPQR presents a robot-to-robot hand signals protocol to exchange information and explicitly coordinate.

Scenario To this end, the SPQR team assumes as case-study a particular situation of the game, the corner-kick. In this scenario timing and efficient coordination is key to achieve good behaviors and score. Our research challenge is designed to communicate intentions among teammates without audio signals nor standard Wi-Fi messages. In fact, we code our robots to explicitly coordinate via gestures. It is worth remarking that this method can be applied to different phases of the game, e.g. localization disambiguation, ball passing, free-kicks. The SPQR demonstrates the gesture-based communications with three robots involved in a corner-kick coordinating by exchanging information via arm gestures (see Figure 1). It is worth remarking that, in this stage, we plan to use gesture exchanged information to support standard Wi-Fi messages in order to reduce the team dependency on a stable Wi-Fi signal. Our idea is to embed predefined protocols with particular motions - likewise human soccer. For example, one arm raised may suggest that a robot is ready to receive the ball.

Figure 1: An example of the SPL scenario used to demonstrate the hand-gesture communication. The kicker and the receiver have the raised hand to perform the visual handshake.

We truly believe that this approch and communication revolution can contribute to our ultimate goal and promote more natural and effective team performance.