Head, Shoulders, Hip and Ball... Hip and Ball! Using Pose Data to Leverage Football Player Orientation

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Problem Statement

Edler people claim that:
- Yesteryear football:
- Today’s faster football:
Yet an unexplored field of research

Methods

Pose Orientation ~ Upper-Torso’s Normal Vector (Super-Resolution + OpenPose + 3D Vision)

Field Orientation ~ Player FoV

Ball Orientation ~ Sphere Influence

Goal

Football Video Feed
Player Pose and Position (+ ball)
Time-based set of Body Orientation / Player

Results

Validation through EPTS devices in youth games. In the presented experiments: $W_{\text{Pose}} = 0.25$  $W_{\text{Pass}} = 0.15$  $W_{\text{Ball}} = 0.6$

Detection Rate: 89.69%  LR-Side Deviation: 92.43%  Mean Absolute Error: 40.00°  Median Absolute Error: 34.07°

Practical Applications

Orientation Assessment through Video  Refining Pass-Probability / Pitch-Control Models
Evaluation of On-Ball and Off-Ball Direction  Reaction Time Measurement