**Background**

- **3D Trajectory Curve and Spatial Relationship Feature based Action Recognition of Volleyball Player**

- **Problems in Volleyball Players Action Recognition**
  - Features: Tennis, Volleyball
  - Occlusion: No (1 player), Yes (6 players)
  - Background Noise: Yes, Yes
  - Viewpoint Variation: Yes, Yes
  - Intra-class Variation: Small, Large

- **Proposal**
  - **Framework**
    - 3D tracking player trajectory
    - Video tracking 3D trajectories of players
    - 3D distance judgment

- **Experimental Result**
  - Spike
  - Block
  - Receive
  - Toss
  - Recognition of "Spike", "Block", "Toss", "Receive", with an accuracy of 98% for each by combining 3D trajectory curve feature & multi-view 2D local motion features

- **Conclusion**
  - Recognize actions of "Spike", "Block", "Toss", "Receive", with an accuracy of 98% for each by combining 3D trajectory curve feature & multi-view 2D local motion features

- **Sports Analysis**
  - Player scoring
  - Tactical analysis
  - Highlights extraction
  - Training simulation

- **Action Recognition**
  - Game Data
    - Action type
    - Player posture
    - Motion feature

- **Global Coarse Motion Feature**
  - 3D curve features of player trajectory
  - 1. Jump height
  - 2. Lowest squat position
  - 3. Nearest position to net
  - 4. Velocity towards net
  - 5. Velocity along the net

- **Local Detailed Motion Feature**
  - Distance relation of player-player & player-ball
  - 1. Min distance to team member
  - 2. Hit point height
  - 3. Distance to hit point

- **Problems to solve**
  - Viewpoint Variation
  - Intra-class Variation
  - Occlusion