Shot estimation in Tennis

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Our dataset: Tennis clips (10-15 seconds each) from ATP players on hard courts

Idea: To predict tennis ball trajectories from the point of racquet drawback

Previous literature:

- MobileNetV2: Inverted Residuals and Linear Bottlenecks, Sandler et al. (2018)
- Deep Learning-Based Algorithm for Recognizing Tennis Balls, Di Wu and Aiping Xiao (2022)
- The use of ARIMA models for reliability forecasting and analysis, SL Hoe and M Xie (1998)
- A Novel LSTM for Multivariate Time Series with Massive Missingness, Nazanin Fouladgar and Kary Främling (2020)

Modalities

What Mihir will do: Shot differentiation, Ball recognition (labelling when a ‘shot’ happens), Deciding metric for prediction reliability

What Ratul will do: Dataset preparation, Stroke interpolation, formulating a RNN baseline

Target for half-time (mid-semester): To predict contacts for forehands and backhands reliably for most players on the ATP Tour

Baselines to be implemented: RNN models on trajectory data

Expected results: To be able to predict shot velocity along with contact points for any tennis player

Fig: Roger Federer hitting a forehand. The keypoints and edges are produced by MobileNetV2 (see the first reference)