Golf Ball Launch Stats From Smartphone Videos

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Golf Launch Monitors

TrackMan: $21,495

Swing Caddie: $399

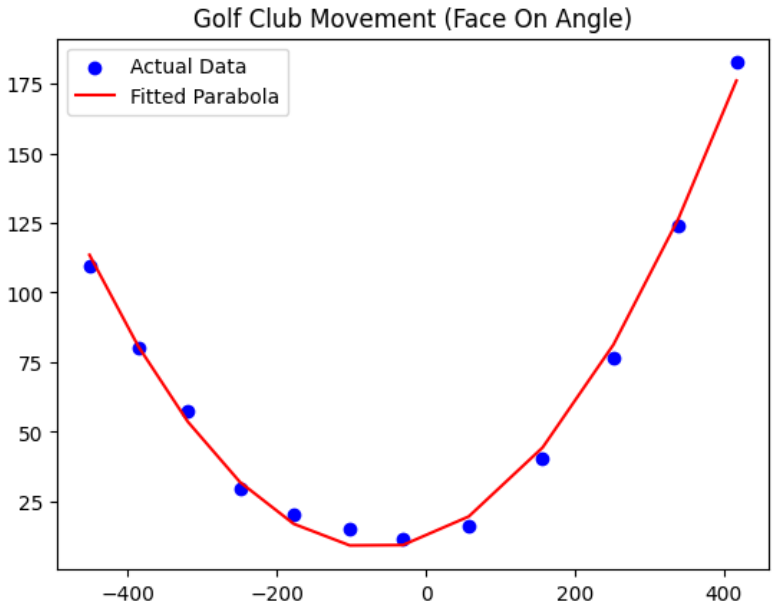
Creating the Dataset

- ❑ Captured **150 golf shots**
  - Two smartphones on tripods 6’ away
  - Filmed in slow-motion 240 frames per second
  - 1 camera “Face On”, 1 camera “Down-the-line”
  - Used Swing Caddie launch monitor for metrics
- ❑ Faced challenges:
  - Occasional launch monitor issues
  - Clicker inconsistencies
- ❑ Result: dataset of **93 usable golf shots**
- ❑ Data processed and stored on Google Drive using tools like CV2

Two Main Models

1) **Detection Model**:
   - ❑ Identify golf ball and club
   - ❑ Track their movement over time

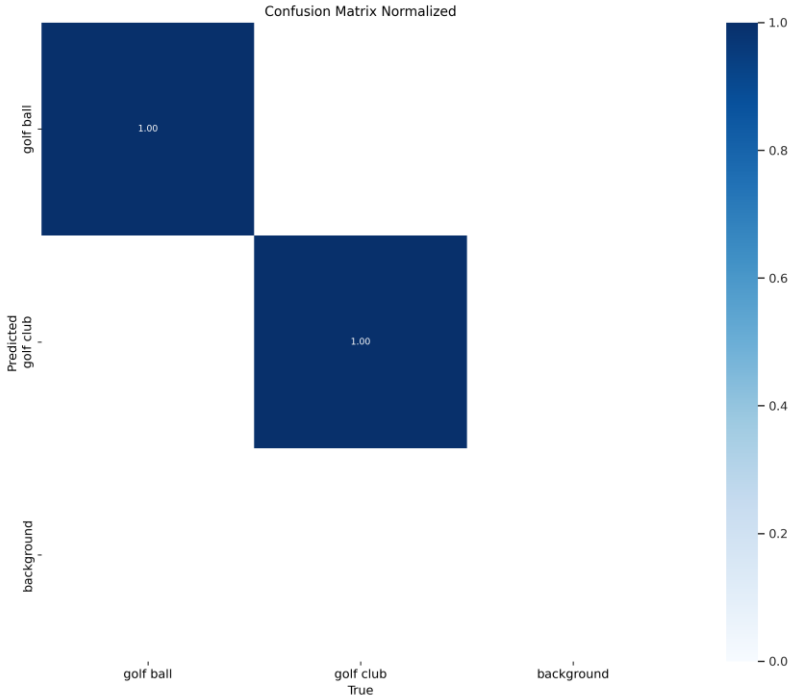
2) **Prediction Model:**
   - ❑ Analyze x,y coordinates of objects across camera frames and angles
   - ❑ Predict golf ball carry distance

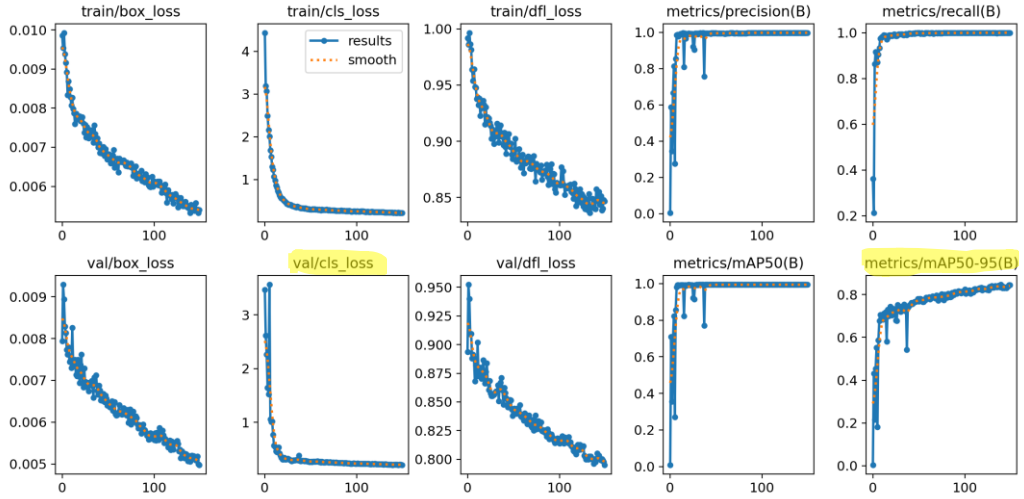


Metric	Result
Carry (yards)	177.8
Swing Speed (mph)	88.6
Ball Speed (mph)	116.4
Launch Angle	16
Apex (feet)	77.2

Detection Model

- Trained YOLOv8 to detect and track golf ball and club frame-by-frame
- Used cvat.ai tool to annotate sample of images





Next Steps

1) Improved dataset

- ❑ Size:
  - Closer to 1,000 shots (had 93 here)
  - Carry distance 115-215 yards (160-190)
- ❑ Quality:
  - Improved camera angles
  - Further distance from golfer

2) Robust prediction model testing

- ❑ Bidirectional RNN
- ❑ Interaction terms of location and speed

3) Use object segmentation instead of detection

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