SwingPigeon Tennis Line Call Technology

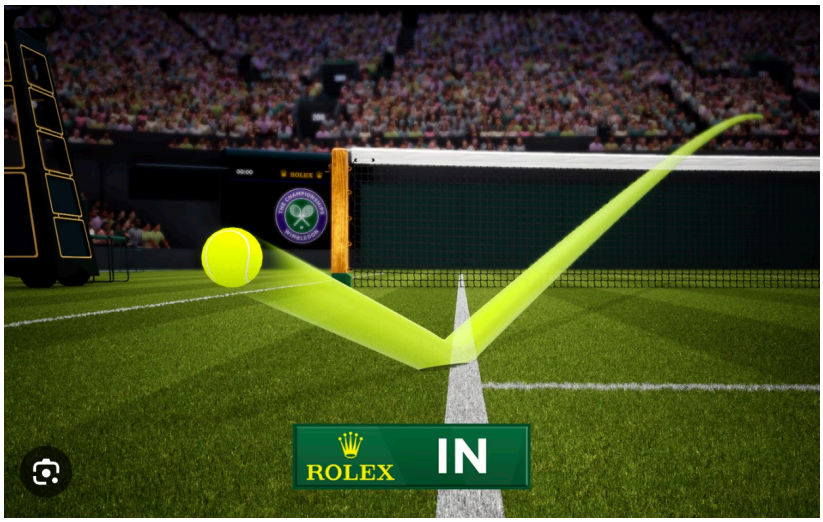
SwingLens LLC

SwingPigeon

SwingPigeon is an upcoming mobile app product that will help aspiring tennis players improve their tennis swing. The AI technology for swing analysis was developed by two Summer Field Session teams starting in May 2025 and continued through August 2025. We sponsored a tennis tournament in Boulder in July 2025 and tested our system with good results. The July launch used a web application for users to review their swings. A user facing mobile application is in development.

Field Session Project

A valuable feature for tennis beyond swing analysis is line calling. In the sport of tennis, there are no referees. Each player is required to call their opponent's ball *in* or *out* during the point. This can lead to confrontations on the court, as players make poor line calls either by mistake or intentionally. A handful of companies have developed hardware and software solutions to make automated line calls. But each solution has drawbacks and limitations.



The SwingPigeon team has a concept for a new approach to line calling that is not in the market. We do not wish to describe this new approach in public yet. We will be on hand at the proposal session August 13th to provide more details in person if you are interested.

While we are withholding important details, we can list the overall approach that will be followed. The field session team will:

- Capture hundreds of videos of live ball bounces near the lines on a tennis court.

    - We will provide the cameras, tripods, and desktop computer to capture the footage
    - We will provide a tennis ball machine that can propel a ball up to 60 mph
    - This will be conducted over multiple sessions to capture videos under different lighting conditions and different court colors.
    - Baseline, service line, and side line cases will be captured.
- Using video object detection:
    - Track the ball in each frame of video and determine where and when the ball impacts the ground
    - Determine the placement of the line and what areas are ‘in’ and ‘out’
- Using the data from object detection:
    - Identify the frame that best depicts the impact of the ball on the ground
    - Make the line call - *in* or *out*

The SwingPigeon team will provide more guidance on how this will be accomplished, just not in public yet.

Implementation

We expect the implementation to be written in Python. The delivered solution will be a Python pipeline that will run on a laptop that will take videos from the court and process them to make the line call. The closer that this pipeline can run in real time the more this solution can work for the real world.

Organization

SwingLens is a private startup with leaders with decades of experience in industry. Members of the summer teams will be available to consult as needed. We have experience with video capture and analysis from our work doing swing analysis over the summer.

Throughout the summer, we met daily for standup and had weekly sprint retros. We expect to have two standups a week with the fall field session. In the early days, we will hold design sessions and technical deep dives into the world of SwingPigeon.