

Youth Hitting Analysis Project - Project Report

From simple video review to a low-cost, data-based development method

Our goal is simple: help families use a phone, GoPro, or ordinary camera to record a young hitter, identify a useful movement change, and use a later video to see what actually changed.

Why the project started

Vincent has played baseball since he was young. As he worked to improve his own swing, he became interested in a basic question: how can a hitter actually get better instead of relying only on feel or a short coaching cue? Later, he began teaching younger players in the community and founded Future Stars Baseball Club. After coaching many young players, he saw the same problem again and again: they wanted to improve, but they often could not see what their bodies were doing.

The project started with a very simple method: record the swing, watch carefully, choose one thing to work on, practice, and record again.

Our current method

Record the Swing	Watch & Compare	Pick One Thing
Practice a Change	Record Again	See What Changed

The point is not to build one “perfect swing.” We want each player to compare first with himself or herself: is the movement becoming clearer, more repeatable, and more useful over time?

Phase I | Using video to find and improve movement

Phase I has included 12 players, with 7 completing at least one retest. Vincent used Side / Back views and Tee / Toss conditions, reviewed multiple swings, selected one or two main problems, and gave practice ideas. The player then practiced independently and returned for a retest.

Early Phase I evidence: the record-review-practice-retest method appears useful for youth development, but it still depends heavily on coaching judgment and needs a stronger data layer.

Leo case: six-category baseline vs retest

FUTURE STARS BASEBALL CLUB

Leo - Hitting Analysis Report

RETEST 1 | September 26, 2026 | Compared with August 12 baseline

1. Retest Context

Leo's August 12 baseline was analyzed before Future Stars adopted the standardized six-category report, the August four-view videos, the integrated baseline report, and Vincent's coach note were retrospectively using the same six-category rubric applied to the September 26 retest. This created a Retest 1 trend without implying that the August report originally contained these scores.

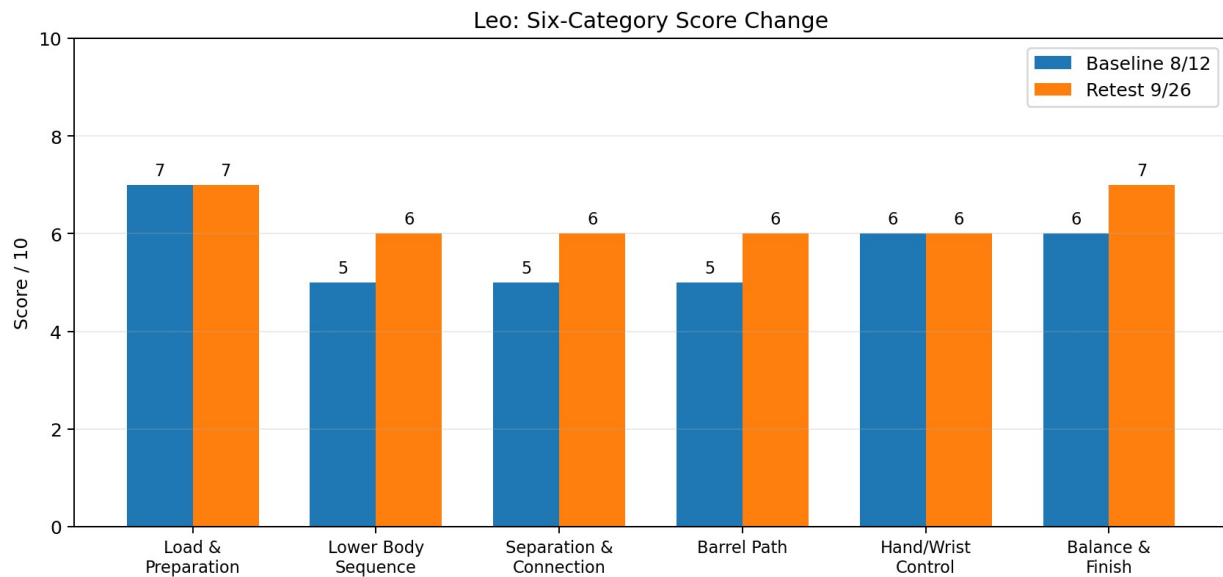
No new September 26 Vincent Coach Report was found in Leo's Drive folder. The retest is then Vincent's original targets: keep the same load, create more arm separation instead of moving back hand more directly through the zone, reduce barrel wrap/rollover, and clean up the slight step-back side and staying in the hip.

2. Baseline -> Retest 1 Score Comparison

Core Category	8/12 Baseline	9/26 Retest 1	Change	Interpretation
1. Load & Preparation	7	7	0	The load remained the primary a
2. Lower-Body Sequencing & Posture	5	6	+1	Stride directly especially co forward drift i
3. Separation & Connection	5	6	+1	The retest showed body rotation arms moving
4. Barrel Path & Through-Zone Extension	5	6	+1	The barrel stayed longer before but not elimin
5. Hand / Wrist Control	6	6	0	Top-hand de yet consisten additional so
6. Balance, Finish & Repeatability	6	7	+1	Retest swing and less side toss swings.

Mechanical Total: 34/60 -> 38/60 | Normalized Score: 56.7/100 -> 63.3/100 | Change: +4/

Screenshot from Leo Retest report: the same six categories were used for baseline and retest comparison.



Six-category score chart: four categories improved by one point; two remained stable.

Leo's mechanical total moved from 34/60 to 38/60, and the normalized score from 56.7 to 63.3. Gains were concentrated in Lower-Body Sequencing & Posture, Separation & Connection, Barrel Path & Extension, and Balance / Finish / Repeatability. Load & Preparation and Hand / Wrist Control remained stable.

One case does not prove that the method always works. It does provide early longitudinal evidence: issues identified in the first review showed visible change after practice and retesting.

Phase II | Turning ordinary video into trackable data

Phase II is the project’s biggest upgrade so far. Instead of asking only “What does Vincent see?”, we now ask whether part of a swing can be turned into movement data that can be saved and compared over time.

The current prototype can track body landmarks from ordinary side-view video and record frame-by-frame 2D measurements such as L/R knee, L/R elbow, Shoulder line, Hip line, Torso lean, and timestamps. We are also testing a four-view combination - Side + Back and Tee + Toss - so one camera can help correct what another camera may miss.

Future Stars Baseball Club - Hitting Biomechanics Dashboard						
A	B	C	D	E	F	
Active Metrics Tracked		Lead Leg Bracing Efficiency		Rear Elbow Connection Slot		
7 Key Angles		178.7 deg		58.9 deg		
Knee, Elbow, Spine & Tilt		Contact Peak (Benchmark 170-180°)		Load Peak (Benchmark 60-80°)		
Biomechanical Metric	Stance (准备)	Load (蓄力/跨步)	Contact (击球瞬间)	Follow-Through (随挥)	Target Range (专业参考)	Kinemat
L Knee (前膝角度)	179.3	156.1	178.7	161.3	170° - 180° at Contact	击球瞬间
R Knee (后膝角度)	176.1	112.5	151.6	160.7	110°-130° Load / 145°-165° Hit	蓄力期门
L Elbow (前肘角度)	155.3	104.4	129.8	164.7	70°-110° Load / 120°-150° Hit	控棒半径
R Elbow (后肘角度)	111.3	58.9	155.7	149.7	60°-80° Slot / 140°-165° Hit	入槽贴肘
Shoulder Line (双肩倾角)	-7.0	19.1	30.6	13.8	-10°~-20° Load / +10°~+30° Hit	前肩微沉
Hip Line (骨盆倾角)	-1.6	22.6	16.9	9.5	0°~5° Stance / 10°~25° Hit	骨盆前倾
Torso Lean (躯干倾角)	1.0	-18.6	3.6	-6.1	-10°~-20° Load / 0°~10° Hit	维持击球
Average Angle (绝对均值)	87.8	65.0	95.3	93.4		7项关节

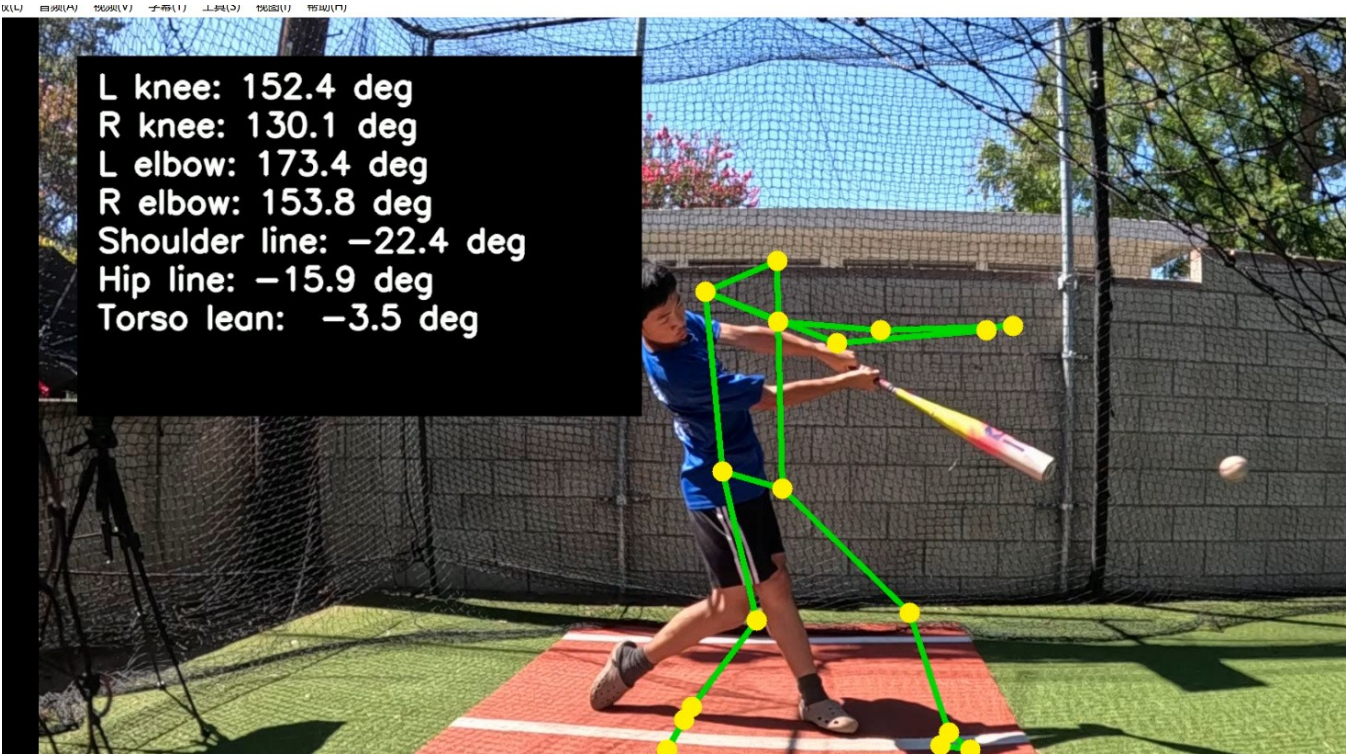
Phase II data table: seven movement angles are organized across Stance, Load, Contact, and Follow-Through, with a progression chart.

Data we have	Question we are testing
Frame-by-frame joint/posture angles	Which measures are stable enough from ordinary home video?
Tee vs Toss	Why does the same player move differently with a static vs moving ball?
Side vs Back	Which problems only become clear from another view?
Baseline vs Retest	When the movement changes, does hitting performance also improve?
More player histories	Can we gradually learn which training ideas work for which movement problems?

The Phase II principle is still low cost and practical access. A family should not need a motion-capture lab; the system should start with a phone or camera they already own.

Leo Hitting Data Analysis | Three kinds of evidence together

These three images show how the project is moving from Phase I to Phase II: start with the movement itself, compare baseline and retest, then turn part of the movement into trackable data.



1. Ordinary video + body landmarks + real-time movement measurements.

FUTURE STARS BASEBALL CLUB

Leo - Hitting Analysis Report

RETEST 1 | September 26, 2026 | Compared with August 12 baseline

1. Retest Context

Leo's August 12 baseline was analyzed before Future Stars adopted the standardized six-categ report, the August four-view videos, the integrated baseline report, and Vincent's coach note we retrospectively using the same six-category rubric applied to the September 26 retest. This crea Retest 1 trend without implying that the August report originally contained these scores.

No new September 26 Vincent Coach Report was found in Leo's Drive folder. The retest is then Vincent's original targets: keep the same load, create more arm separation instead of moving bc hand more directly through the zone, reduce barrel wrap/rollover, and clean up the slight step-a back side and staying in the hip.

2. Baseline -> Retest 1 Score Comparison

Core Category	8/12 Baseline	9/26 Retest 1	Change	Interpretatio
1. Load & Preparation	7	7	0	The load rem the primary a
2. Lower-Body Sequencing & Posture	5	6	+1	Stride directl especially co forward drift i
3. Separation & Connection	5	6	+1	The retest sh body rotation arms moving
4. Barrel Path & Through-Zone Extension	5	6	+1	The barrel st longer before but not elimin
5. Hand / Wrist Control	6	6	0	Top-hand de yet consisten additional so
6. Balance, Finish & Repeatability	6	7	+1	Retest swing and less side toss swings.

Mechanical Total: 34/60 -> 38/60 | Normalized Score: 56.7/100 -> 63.3/100 | Change: +4/

2. Phase I: six-category score and retest comparison.

Future Stars Baseball Club - Hitting Biomechanics Dashboard						
A	B	C	D	E	F	
Player Metrics (Pitcher)			Coach Rating (Hitting Coach)		Team Status (Construction Phase)	
7 Key Angles			178.7 deg		58.9 deg	
Knee, Elbow, Spine & Tr			Contact Peak (Benchmark 170-180°)		Load Peak (Benchmark 60-80°)	
Biomechanical Metric	Stance (准备)	Load (发力/跨步)	Contact (击球瞬间)	Follow-Through (随挥)	Target Range (专业参考)	Kinematic Phase (运动阶段)
L Knee (前膝角度)	179.3	156.1	178.7		161.3 170° - 180° at Contact	击球瞬间
R Knee (后膝角度)	176.1	112.5	151.6		160.7 110°-130° Load / 145°-165° Hit	发力期/ 控棒半径
L Elbow (肘部角度)	155.3	104.4	129.8		164.7 70°-110° Load / 120°-150° Hit	入棒阶段
R Elbow (肘部角度)	111.3	58.9	155.7		149.7 60°-80° Slot / 140°-160° Hit	前伸阶段
Shoulder Line (双肩领角)	-7.0	19.1	30.6		13.8 -10°~20° Load / +10°~+30° Hit	肩前阶段
Hip Line (骨盆领角)	-1.6	22.6	16.9		9.5 0°~5° Stance / 10°~25° Hit	骨盆前倾
Torso Lean (躯干领角)	1.0	-18.6	3.6		-6.1 -10°~20° Load / 0°~10° Hit	维持击球
Average Angle (绝对均值)	87.8	65.0	95.3	93.4		7项关节

3. Phase II: movement-angle table and phase chart.

The long-term goal is not simply a better-looking report. It is a personal player history: Video + Data + Problem + Practice + Retest Result.

Next Research Questions | What we still do not know

Phase II can now produce movement data, and AI can already turn that information into a detailed draft analysis. But we know this is still far from a finished solution. The most interesting part of the project is the set of questions we still have to test.

- Which 2D measurements from a normal phone or GoPro are stable enough to track over time?
- How standardized does the camera setup need to be for fair session-to-session comparison?
- If an angle differs from a reference range, does that actually mean the player should change it?
- How do we turn an observed movement problem into a drill or cue that a young player can actually perform?
- When movement data changes, how do we know contact quality, consistency, or game performance improved too?
- How should AI separate direct observation, possible interpretation, and a recommendation worth testing?
- As the dataset grows, can we build more individualized methods for different ages and player types?

Why put the project on GitHub?

We want to share the method, code, data structure, failed ideas, and open questions. Vincent and Future Stars cannot solve every part alone. GitHub can give coaches, students, developers, and researchers a way to point out mistakes, suggest better measurements, improve code, or explain why an idea may not be reliable.

The goal of being open is not to look more “professional.” It is because the project is still learning. We hope it can eventually become something affordable and useful for ordinary families and young baseball players.

Project principle: start with real video, use data to see more clearly, let AI help organize possibilities, and use practice plus retesting to decide whether a suggestion actually helps.

Future Stars Baseball Club | Youth Hitting Analysis Project

Founder & Project Lead: Vincent Hall