Stamina App

Presenter: Navid All Gharaee
Supervisor: Prof. Taherinia

2022, July

Overview

Describing a problem

Pose Estimation Algorithm

Existing Applications

Development Tools

Implementation

Demo

Describing a problem

The New York Times

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ATHS NEAR 100,000, AN INCALCULAB

real jokester · **Michael Sorkin**, 71, New York City, champion of social justice through architecture · **George Valentine**, 66, Washington, D.C., lawyer who mentored others · **James Quigley**, 77, Chicago, rebel of the family · **Sherman Pittman**, 61, Chicago, dedicated his life to his church and his neighborhood · **Susan McPherson Gottsegen**, 74, Palm Beach, Fla., loyal and generous friend to many · **Andreas Koutsoudakis**, 59, New York City, trailblazer for TriBeCa · **Bob Barnum**, 64, St. Petersburg, Fla., leader in Florida Pride events · **Noel Sinkiat**, 64, Olney, Md., nurse planning for retirement · **Thomas E. Anglin**, 85, Cumming, Ga., created many wonderful memories for his family · **Robert Manley Argo Jr.**, 75, South Bay, Calif., member of Del Amo Flyers · **Michael McKinnell**, 84, Beverly, Mass., architect of Boston's monumental City Hall · **Huguette Dorsey**, 94, Somerville, N.J., coached several championship-winning junior high girls basketball teams · **Lynne Sierra**, 68, Roselle, Ill., grandmother who was always full of ideas · **Louvenia Henderson**, 44, Tonawanda, N.Y., proud single mother of three · **Carol Sue Rubin**, 69, West Bloomfield, Mich., loved travel, mahjong and crossword puzzles · **Marion Lucille Kujda**, 92, Royal Oak, Mich., would use chalk and oil paints to capture family portraits · **Alice Chavdarian**, 92, Michigan, loving, generous and adventurous spirit · **Bassey Offiong**, 25, Michigan, saw friends at their worst but brought out their best · **Bobby Joseph Hebert**, 81, Cut Off, La., a 33-year career with the jazz trumpet virtuoso · **Cristina**, 64, New York City, downtown New York singer with a cult following · **Robert H. Westphal**, 75, Fond du Lac, Wis., statesman in the construction industry · **Clair Dunlap**, 89, Washington, pilot still teaching people to fly at 88 · **Marylou Armer**, 43, Sonoma Valley, Calif., veteran police detective · **Regina D. Cullen**, 81, Shrewsbury, Mass., small in stature but strong in spirit · **Sandra Santos-Vizcaino**, 54, New York City, beloved public school teacher · **Frank Gabrin**, 60, New York City, emergency room doctor who died in husband's arms · **Sterling E. Matthews**, 60, Midlothian, Va., cancer survivor who served as a deacon · **Alby Kass**, 89, California, lead singer of a Yiddish folk group · **Roger Eckart**, 78, Indiana, retired firefighter and old-school barber · **Martin Douglas**, 71, New York City, maestro of a steel-pan band · **Daniel Spector**, 68, Memphis, mentor to other Memphis artists · **Mary Minervini**, 91, Oak Lawn, Ill., sign-language interpreter · **Salomon S. Podgursky**, 84, Morristown, N.J., loved to figure out how things worked · **Dale E. Thurman**, 65, Lexington, Ky., tailor known for his exacting work and strong opinions · **Ellis Marsalis**, 85, New Orleans, jazz pianist and patriarch of a family of musicians · **Richard Passman**, 94, Silver Spring, Md., rocket engineer in the early days of supersonic flight · **David Driskell**, 88, Hyattsville, Md., champion of African-American art · **Bucky Pizzarelli**, 94, Saddle River, N.J., master of jazz guitar · **Tarlach MacNiallais**, 57, New York City, Belfast-Bailargeon, 72, Dennisport, Mass., true spirit · **Jack Butler**, 78, Indiana, lived

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The Guardian

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Virus patients more likely to die may have ventilators taken away

Doctors to get guidance on rationing care if NHS becomes overwhelmed

Denis Campbell, Alexandra Topping, Caelainn Barr

Stable coronavirus patients could be taken off ventilators in favour of saving those more likely to survive, it emerged last night, as the UK braced for the outbreak to reach 1,000 deaths a day by the end of the week.

In a stark new document issued by the British Medical Association as the death toll rose by a record 563 in a day, doctors set out guidelines to ration care if the NHS becomes overwhelmed with new cases as the outbreak peaks.

The new toll brings the overall total to 2,352, an increase of 31% on Tuesday's figure. If the total continues to grow in line with increases over the last week, it is on course to go past 1,000 new deaths recorded each day within three to four days.

Under the proposals, designed to give doctors ethical guidance on how to decide who should get life-saving care when resources are stretched, hospitals would impose "severe" limits on who is put on a ventilator.

Large numbers of patients could be denied care, with those facing a poor prognosis losing the potentially life-saving equipment even if their condition is improving.

The body suggests younger, healthier people could be given priority over older people and those with an underlying illness may not get treatment

'Difficult decisions will be needed about scarce resources'

British Medical Association *Document*

that could save them. The document explains that the guidance has been drawn up because when the outbreak peaks "it is possible that serious health needs may outstrip availability and difficult decisions will be required about how to distribute scare lifesaving resources".

The BMA published its proposals amid ongoing concern over limits to NHS resources, with officials admitting that only 30 of the 30,000 new ventilators needed as the outbreak grows will be available by next week.

They emerged as:

- A retired hospital medical director, Alfa Saadu, died of the virus after volunteering at a Hertfordshire hospital at the age of 68.
- New applications for 5 →

Just 2,000 key NHS staff tested for Covid-19

Ian Sample and Rowena Mason

Health officials must abandon strict production rules that are hampering the introduction of mass testing for coronavirus, scientists warned yesterday, after the government admitted that just 2,000 of half a million front-line NHS staff had been tested to date.

Official procedures describe the precise chemicals and equipment that must be used to test patients. But with specific reagents in short supply, senior researchers told the Guardian the UK must find alternatives to avoid more delays, with one arguing: "These are not normal times."

The UK's poor testing figures compared with other nations have caused a political backlash, with critics asking why the government is both failing to source the right equipment and refusing to agree to expand testing to the general population.

Only about 8,000 hospital patients and NHS staff are being tested daily – well short of the government's targets and far below 2 →

Party's over: Edinburgh and Wimbledon axed

Further gloom descended over summer as all five Edinburgh festivals - including the world's biggest arts festival, the fringe - were cancelled for 2020, as was the tennis at Wimbledon. Page 11 and Sport →

BRK

World News

239/8 CORONAVIRUS PANDEMIC Today

Lorem Ipsum Dolor Sit Amet, Consectetur Adipiscing Elit.

BREAKING COVID-19

Lorem ipsum dolor

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nam libero lacus, aliquet eget odio vel, eleifend tristique eros. Praesent consequat congue mi dapibus. Phasellus interdum elementum leo, ut ultrices mauris viverra sit amet. Class aptent taciti Phasellus non tellus in purus auctor. Lorem ipsum dolor sit amet, consectetur adipiscing elit. Nam libero lacus, aliquet eget odio vel, eleifend tristique eros. Praesent consequat congue mi dapibus. Phasellus interdum

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The Des Moines Register

THE NEWSPAPER IOWA DEPENDS UPON ■ Des Moines, Iowa, Friday Morning, October 5, 1979
Four Sections, price 25 cents

350,000 HAIL THE POPE IN STIRRING D.M. VISIT

REGISTER PHOTO BY BOB MODERSOHN

HE BRUSHES RURAL IOWA WITH HIS LOVE

Historic Iowa day in tranquil pasture

, 76, Coun- r's aide · ghkeepsie, icy Volun- t, 97, Bev- counter at re · **Mike** Y., first re- icks · **Chi-** timore, so- tical fund- , Chicago, **Kafkis**, 91, ctory jobs ra Louise 52, Nevada, would walk her children to school every morning · **Fernando Miteff**, 60, New York City, graffiti artist with a generous spirit · **John Watson**, 73, Philadelphia, anywhere he went, he took pictures · **Joyce Posson Winston**, 93, North Bergen, N.J., editor at the Ladies' Home Journal · **John B. Lynch**, 76, Wilmington, Mass., lifelong educator · **Orlando Moncada**, 56, Bronxville, N.Y., left Peru and grabbed hold of the American dream · **John Schoffstall**, 41, Terre Haute, Ind., volunteer youth football coach · **Theodore Gaffney**, 92, Washington,

THE LUFKIN DAILY NEWS

DAY, NOVEMBER 22, 2020 LUFKINDAILYNEWS.COM $2.00

CORONAVIRUS

'It's real'

HOLIDAYS

Holiday hoopla at hand

By JESS HUFF
The Lufkin Daily News

City workers moved quickly across the streets of downtown Lufkin in 70-degree weather Friday afternoon, fixing lights and hanging garlands as they prepare the city for the holiday season.

Lufkin street department employees Jammie Stanley and Manuel Perez were inching down Burke Avenue re-gluing the lights and making sure each bulb is burning so the city is prepared for Dec. 1 when it will all be lit, Stanley said.

It's a lot of work, but it's fun, he said. There's a lot of preparation but Stanley and Perez only had a little work left to do before they were done Friday. All the two men had left was to finish up Second Street.

"I love Christmas," Stanley said. "I'm ready for it."

Stanley's favorite part is being with his family and he is excited because this is his grandson Connor's first Christmas, he said.

SEE CHRISTMAS, PAGE 3A

SITVS TERRÆ CANAAN, SIVE TERRÆ PROMISSIONIS
PALÆSTINÆ
SS. BIBLIORVM
TECHNOGYM

SORRY, WE'RE
CLOSED

Fitness Oriented Services

Apple Fitness +

Peloton

Fitness Oriented Services

- No mentoring on the user
- User performing actions in wrong manner
- Damages in long-term

Overview

Describing a problem

Pose Estimation Algorithm

Existing Applications

Development Tools

Implementation

Demo

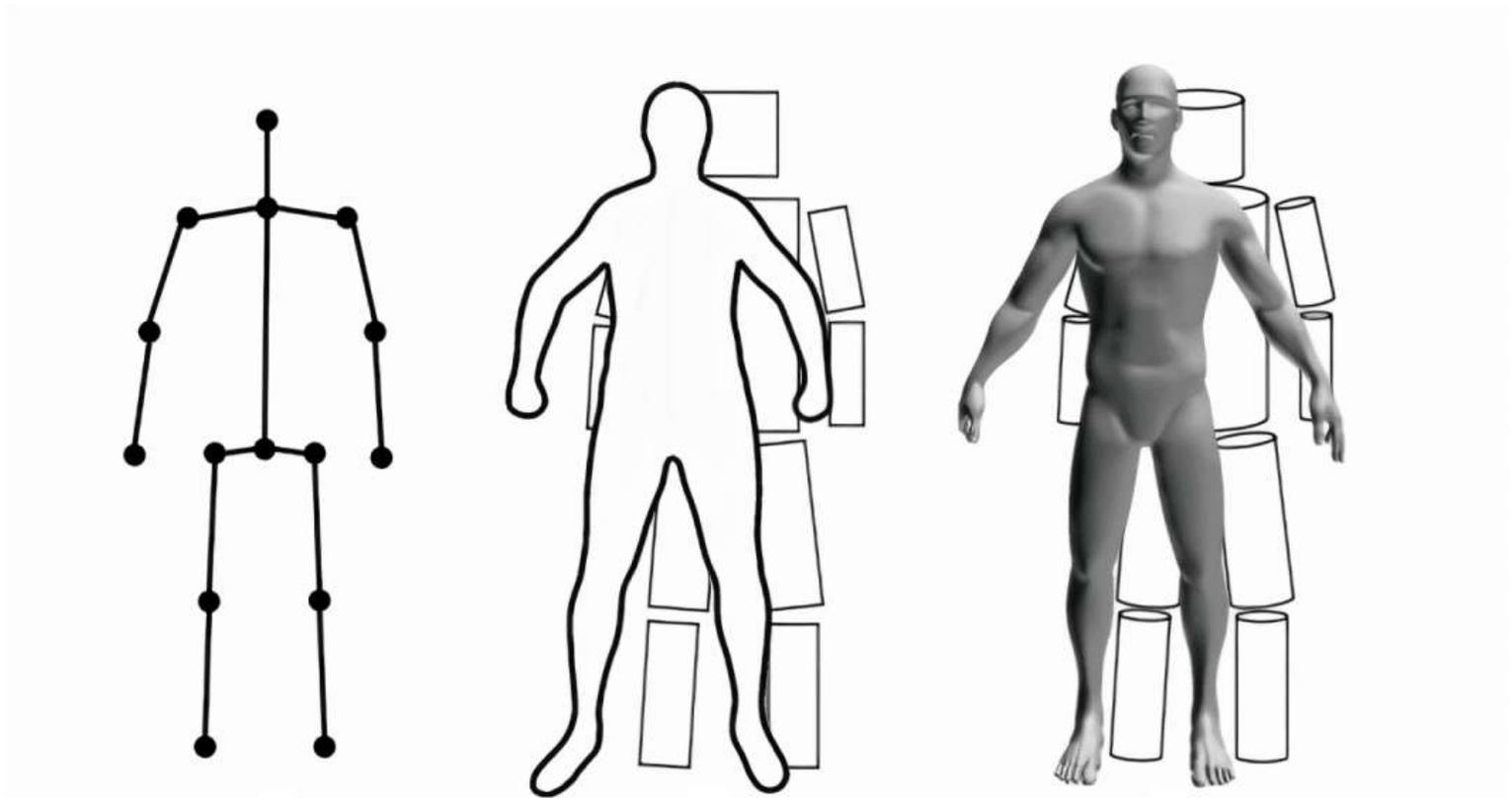
What’s Pose Estimation?

Pose Estimation

Human Body Models

- Skeleton-based
- Contour-based
- volume-based

HUMAN BODY MODELS



skeleton-based model

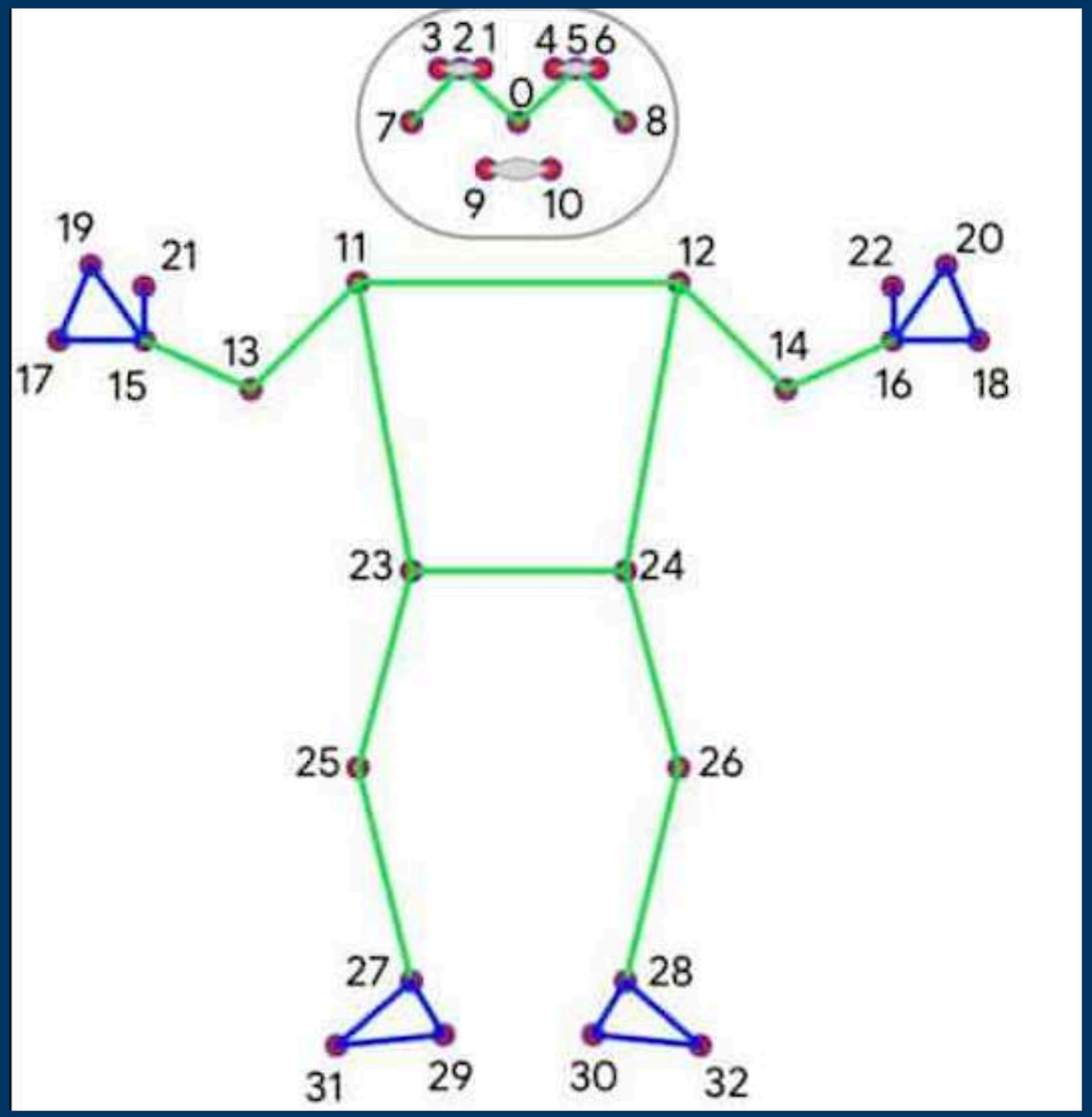
contour-based model

volume-based model

Skelton-based Advantages

- Flexibility
- Simplicity

MediaPipe Pose



0. nose
1. right eye inner
2. right eye
3. right eye outer
4. left eye inner
5. left eye
6. left eye outer
7. right ear
8 left ear
9. mouth right
10. mouth left
11. right shoulder
12. left shoulder
13. right elbow
14. left elbow
15. right wrist
16. left wrist
17. right pinky knuckle #1
18 left pinky knuckle #1
19. right index knuclke #1
20. left index knuckle #1
21. right thumb knuckle #2
22. left thumb knuckle #2
23. right hip
24. left hip
25 right knee
26. left knee
27. right ankle
28. left ankle
29. right heel
30. left heel
31. right foot index
32. left foot index

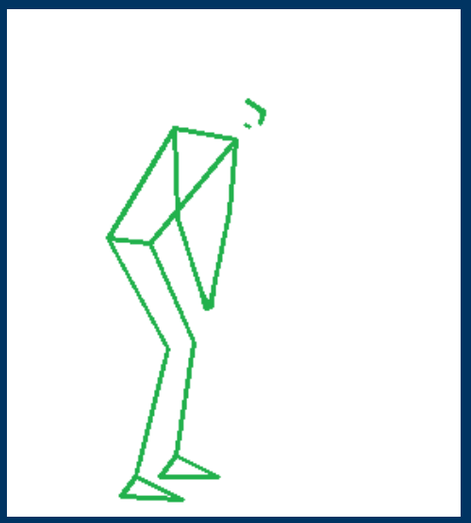
Example

Reference

+

Test

Annotated Image



Skelton

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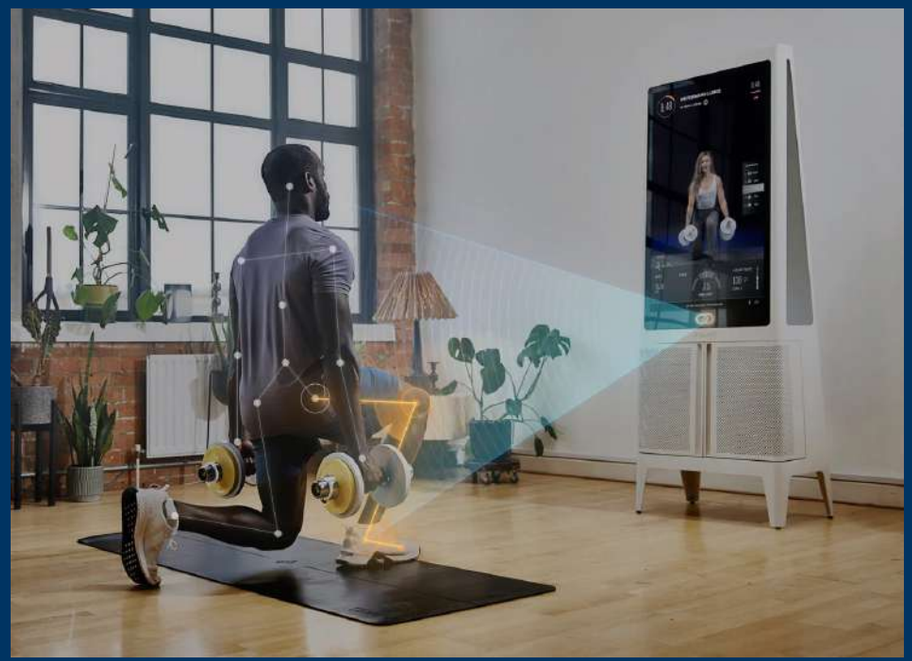
Tempo Studio

Pros

- ✓ Instant form feedback and real-time guidance
- ✓ Up to 1000+ classes
- ✓ 42” screen

Cons

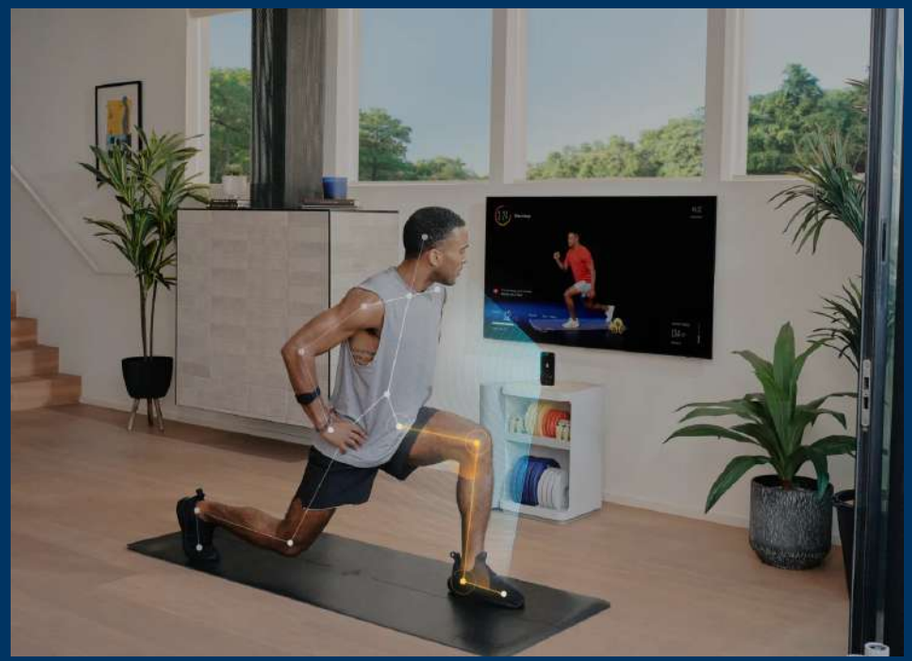
- × Requires a spacious place
- × Too expensive for many users
- × Lack of Portability



Tempo Move

Pros

- ✓ Instant form feedback and real-time guidance
- ✓ Up to 1000+ classes



Cons

- × Only works with iPhone
- × Requires a TV to show the content
- × Compatible with certain iPhone models
- × Too expensive for many users

Plank by Exer

Pros

✓ Instant form feedback and real-time guidance

✓ Free!

Cons

× Only works with iPhone

× Compatible with certain iPhone models

Common Problem with Existing Solutions

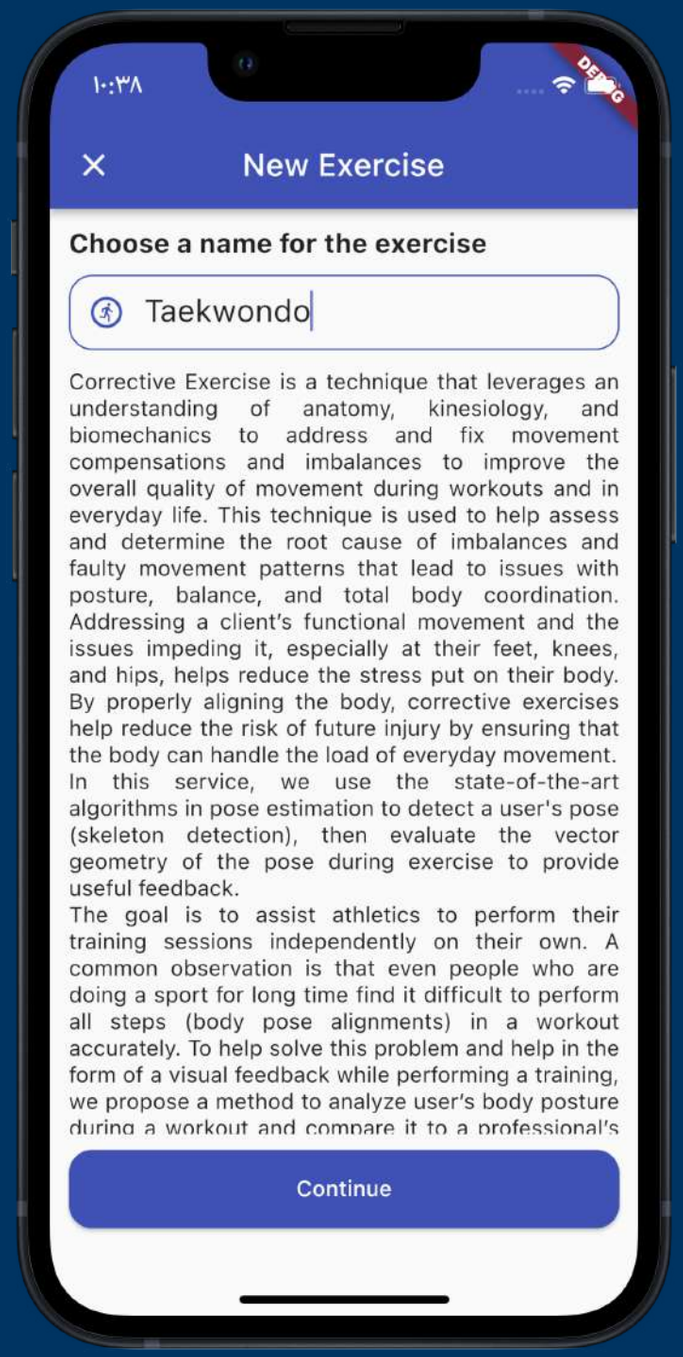
- Expensive
- Impractical
- Special hardware & platform requirements

Inaccessible to many people!

Stamina

Stamina

- Create a session
- Choose reference images
- Choose test images (or test video)
- Compare the accuracy of the movements



Stamina

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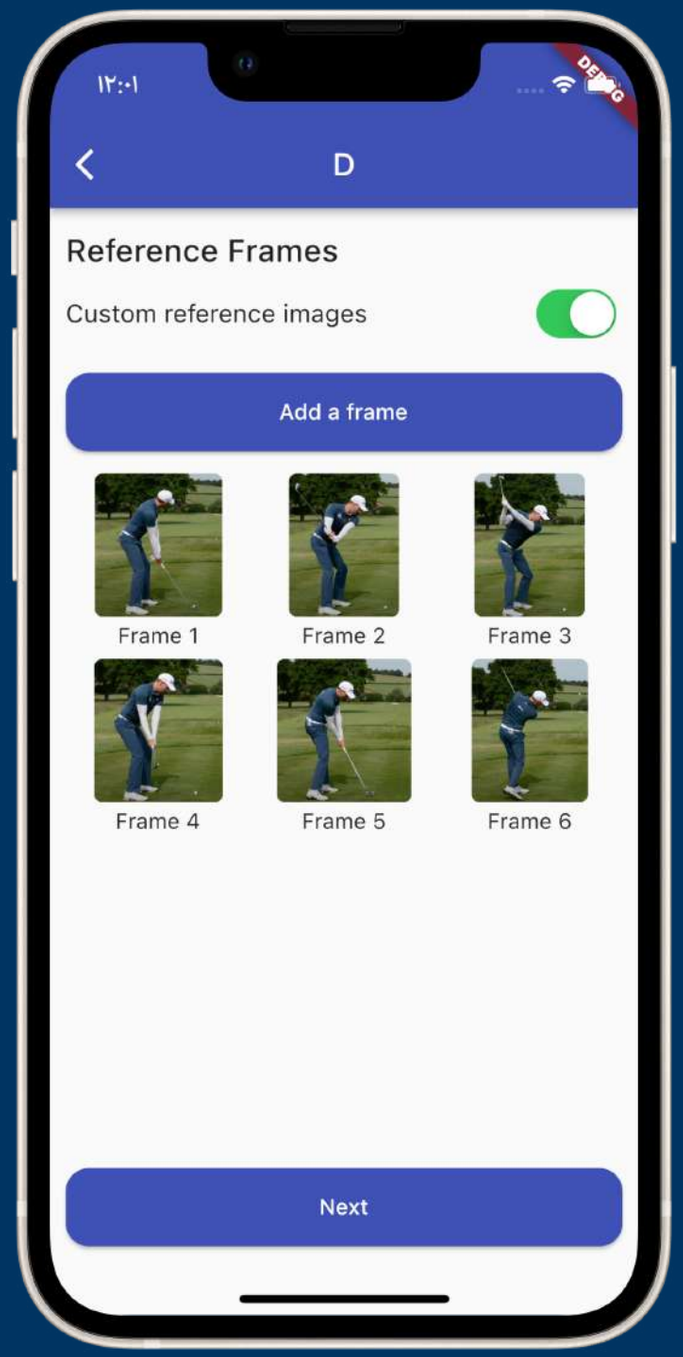

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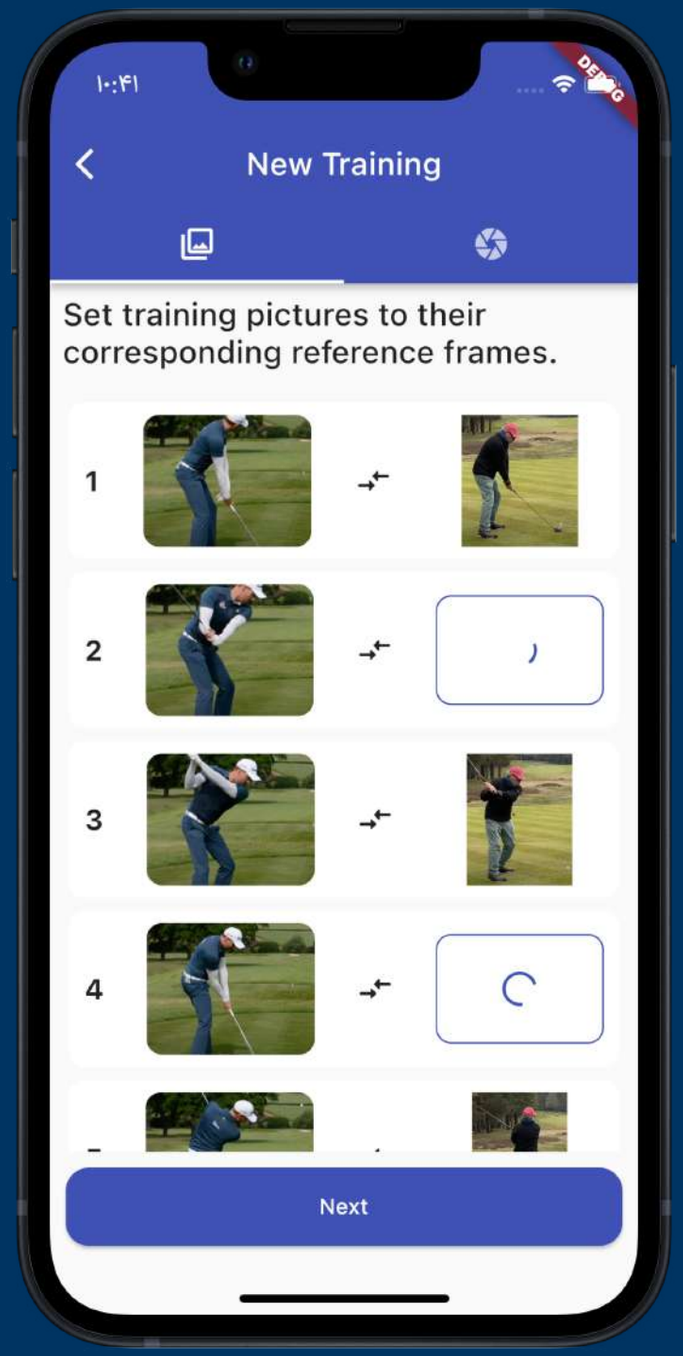

Stamina

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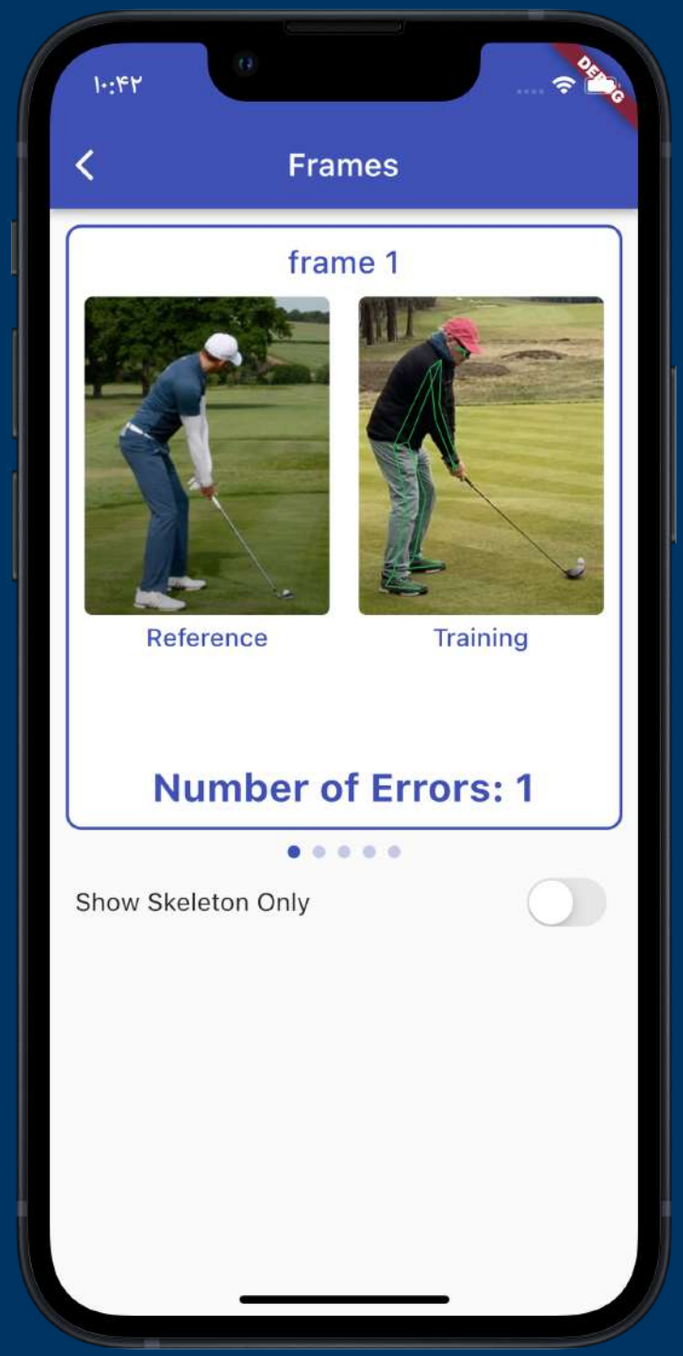

Stamina

- Compatible for both iOS & Android
- Does not require special hardware
- Free!

Accessible to everybody!

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Development Tools

Flutter

Dart

Development Tools

VS Code

The Main IDE

Development Tools

Xcode

iOS Builds

Development Tools

Google Firebase

Backend Server, Authentication, Cloud Storage

Development Tools

Github

Version Control, Android Build

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Architecture

What is a Good Architecture?

Criteria for a Good Architecture

- Separates UI from Logic
- Easy to develop
- maintenance
- Sustainable

PRESENTATION

User Interface

Presentation Logic

BUSINESS

Application Facade

Workflow

Components

Entities

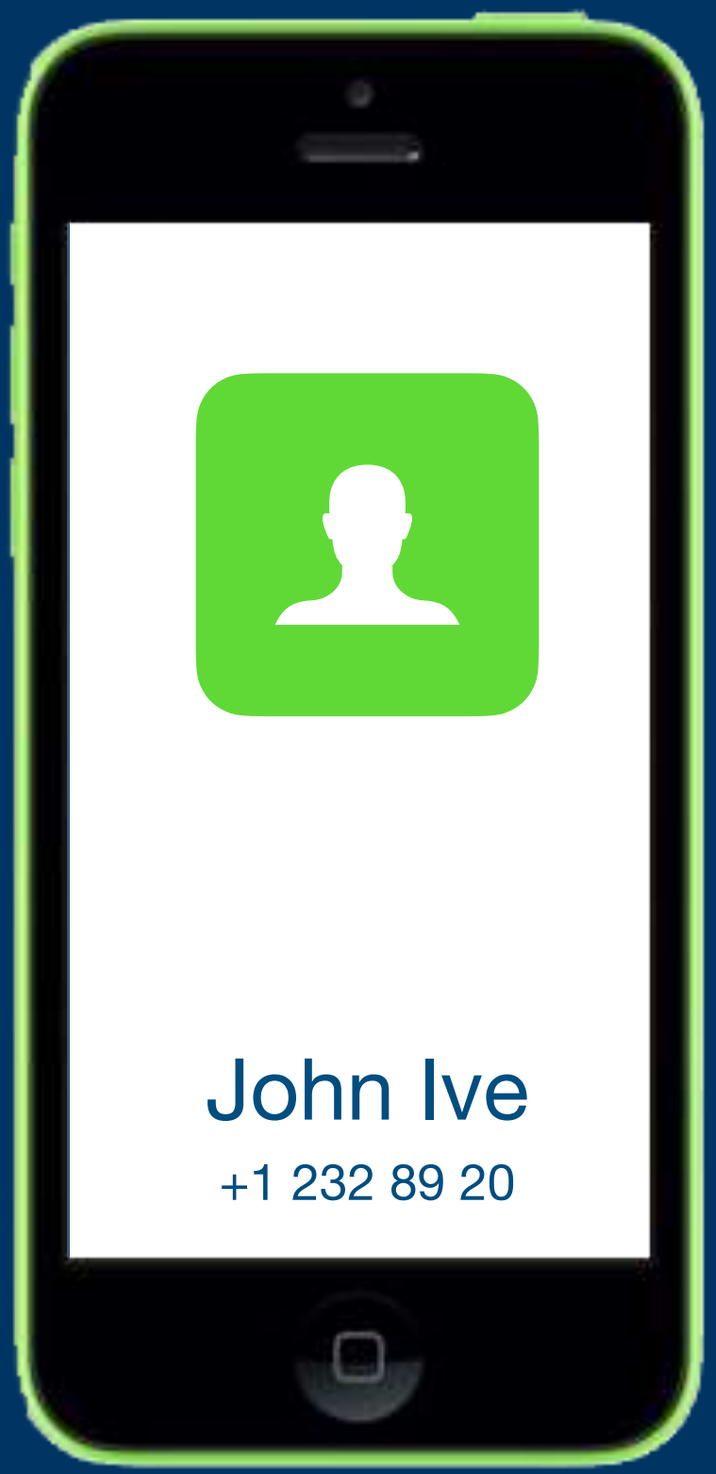
DATA

Data Access

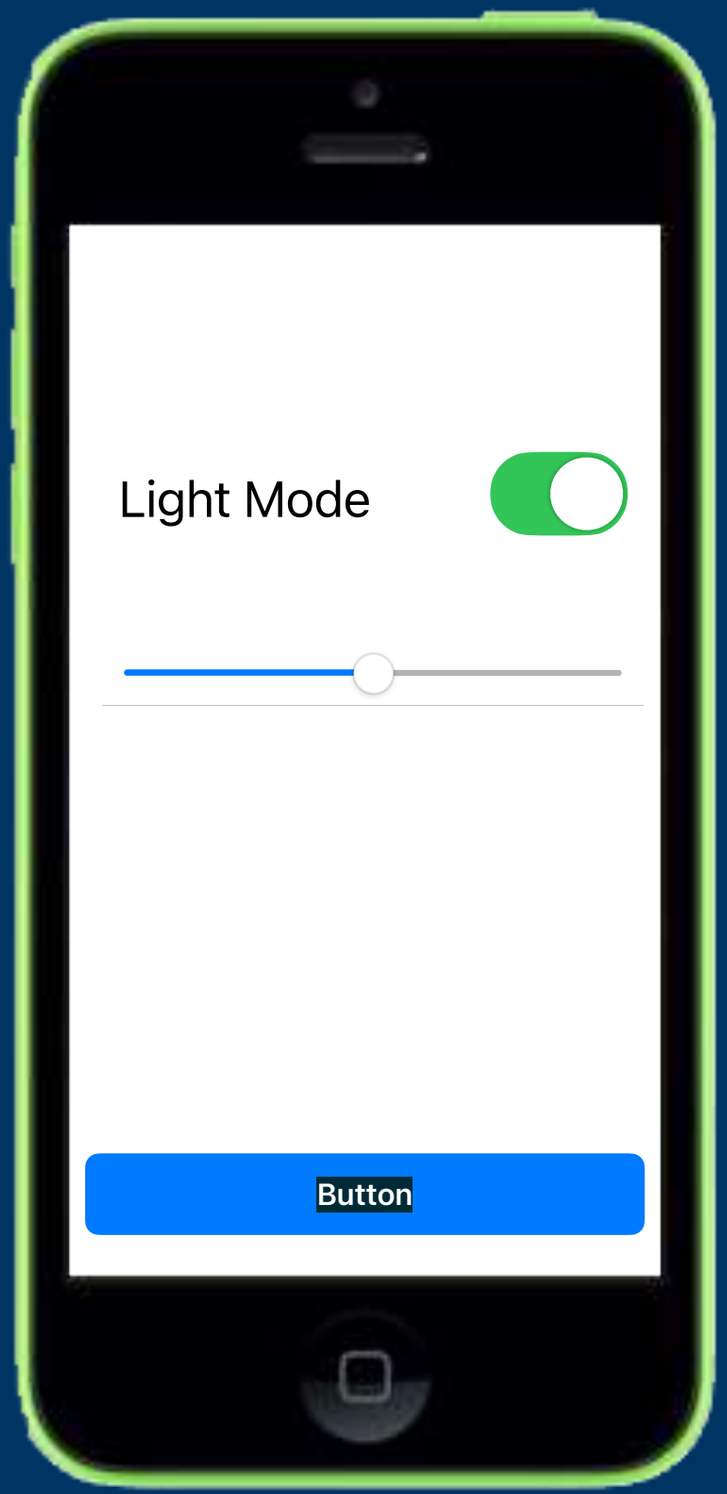
Data Utilities

Service Tools

What Flutter Provides



StatelessWidget

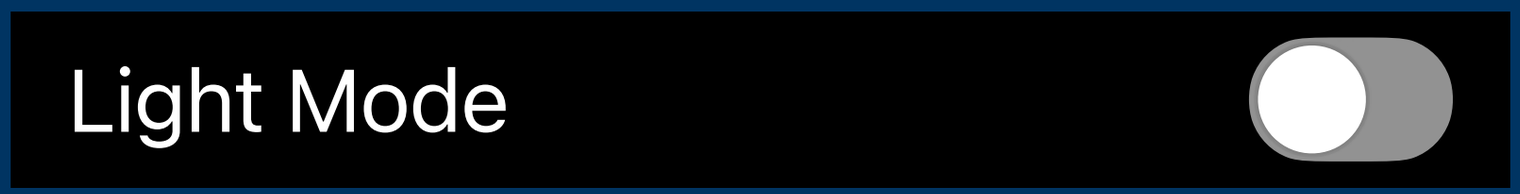


StatefullWidget

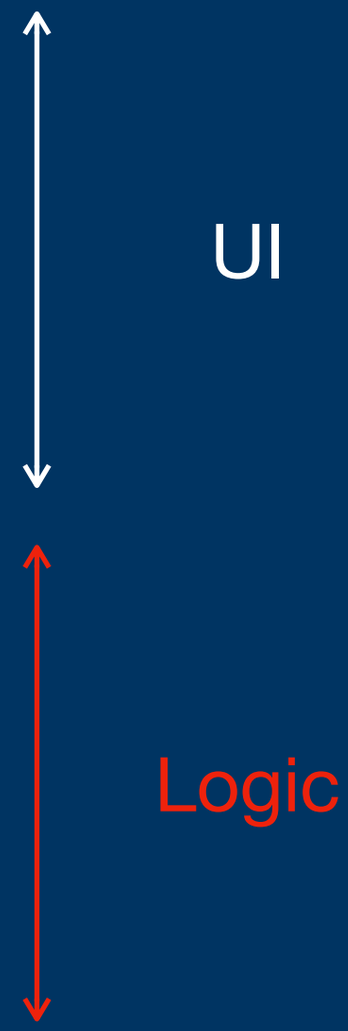
SetState (() {}) → Rebuild UI

Example

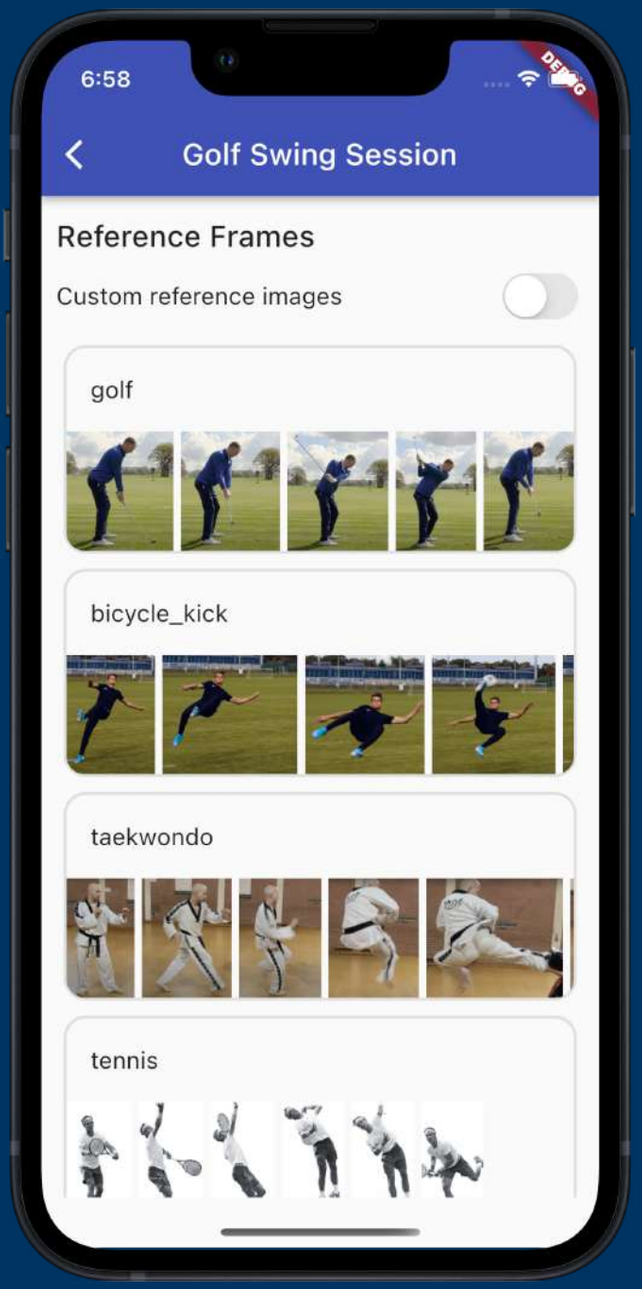
Light Mode


Light Mode

```
class AuthenticationPage extends StatefulWidget {
  @override
  Widget build(BuildContext context) {
    return Container(
      child: Switch(
        title: "Light Mode",
        onChanged: (){
              Change UI background color
              Save Changes to Memory
              Let all elements know about the change
        },
      ),
)
```

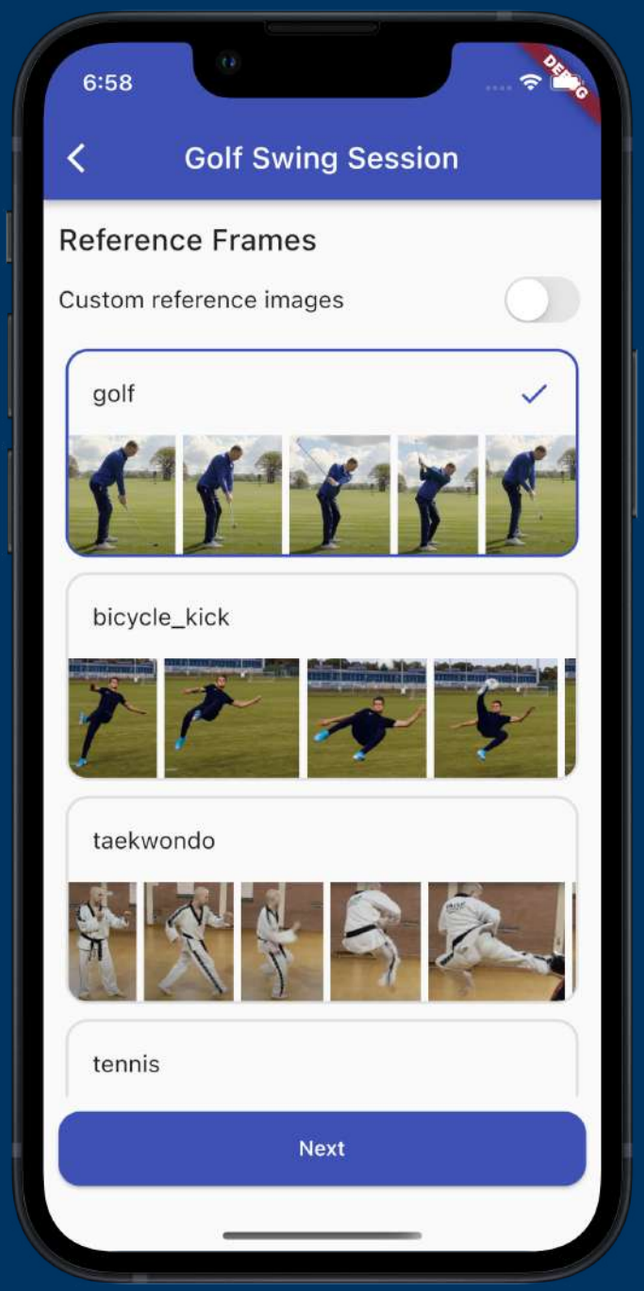


Reference Setup Page



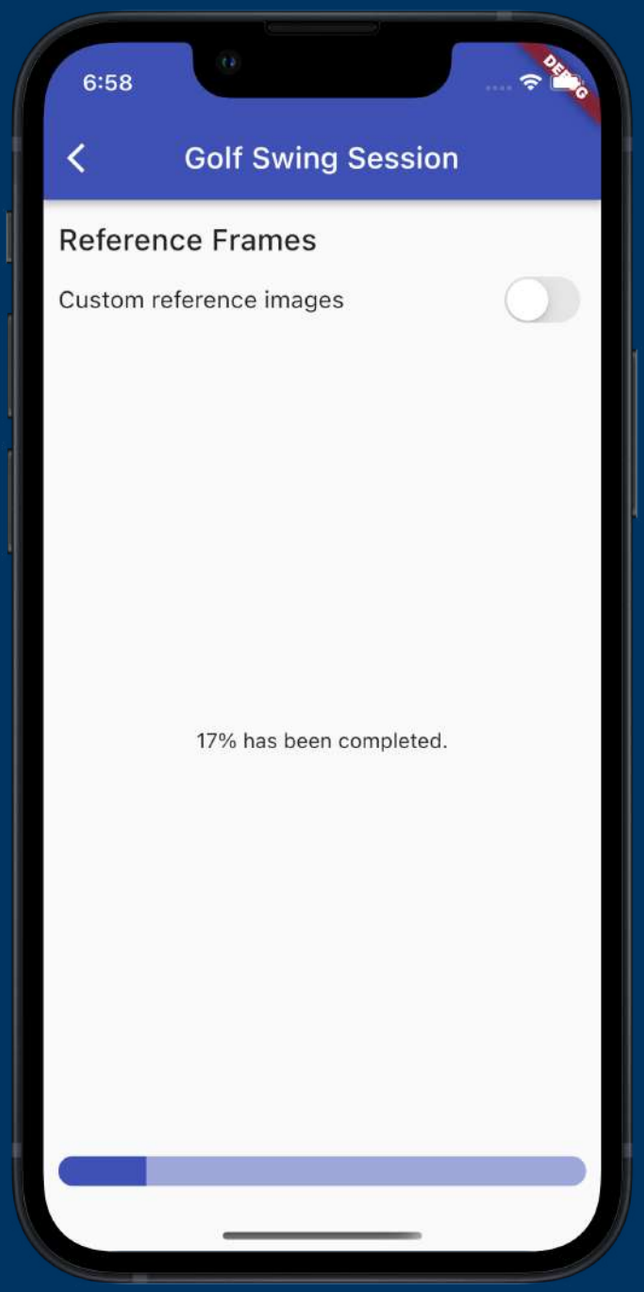
Initial State

Reference Setup Page



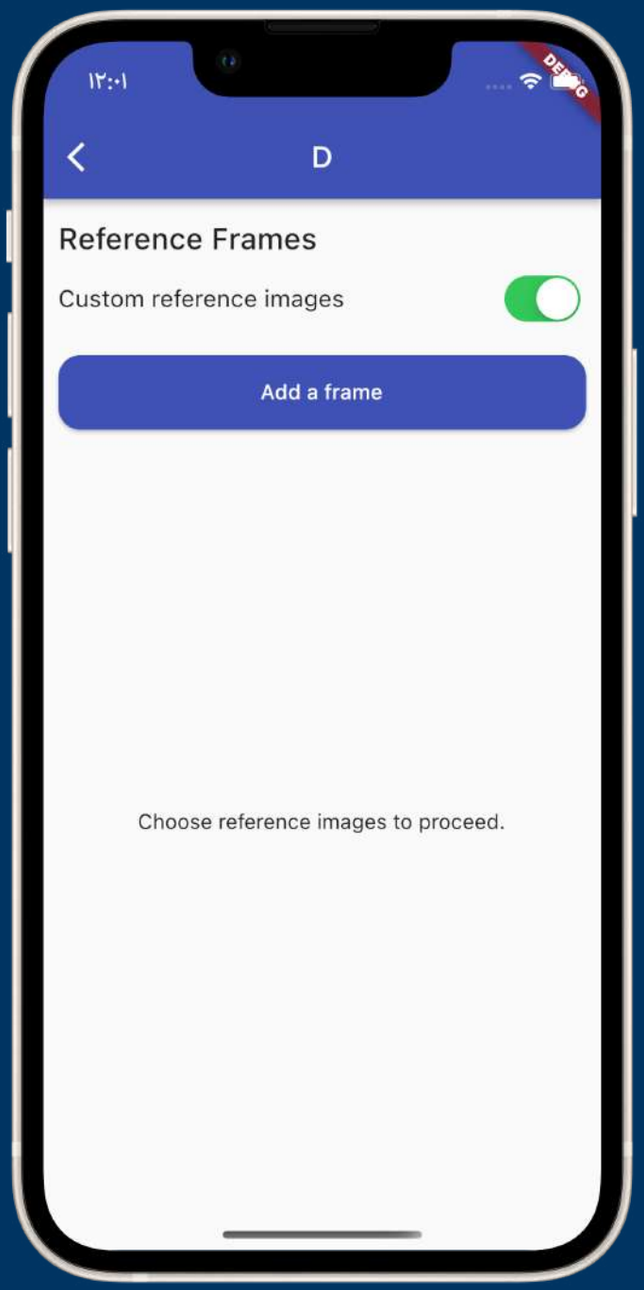
Predefined reference image is selected

Reference Setup Page



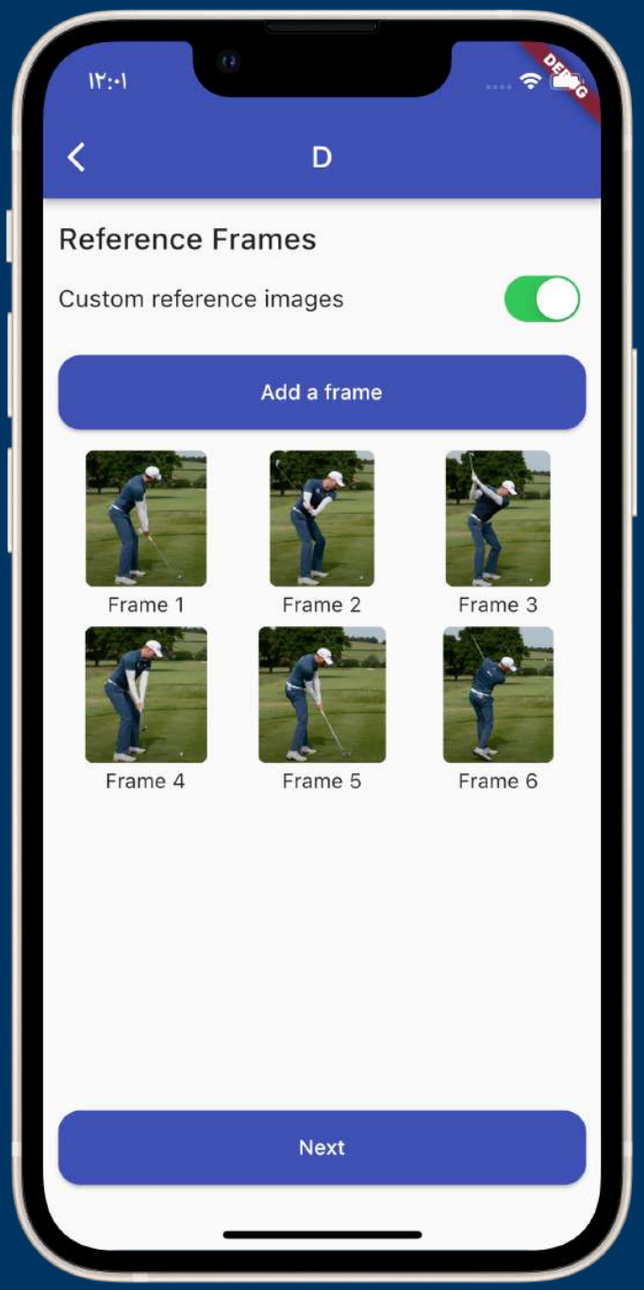
Reference images are being uploaded

Reference Setup Page



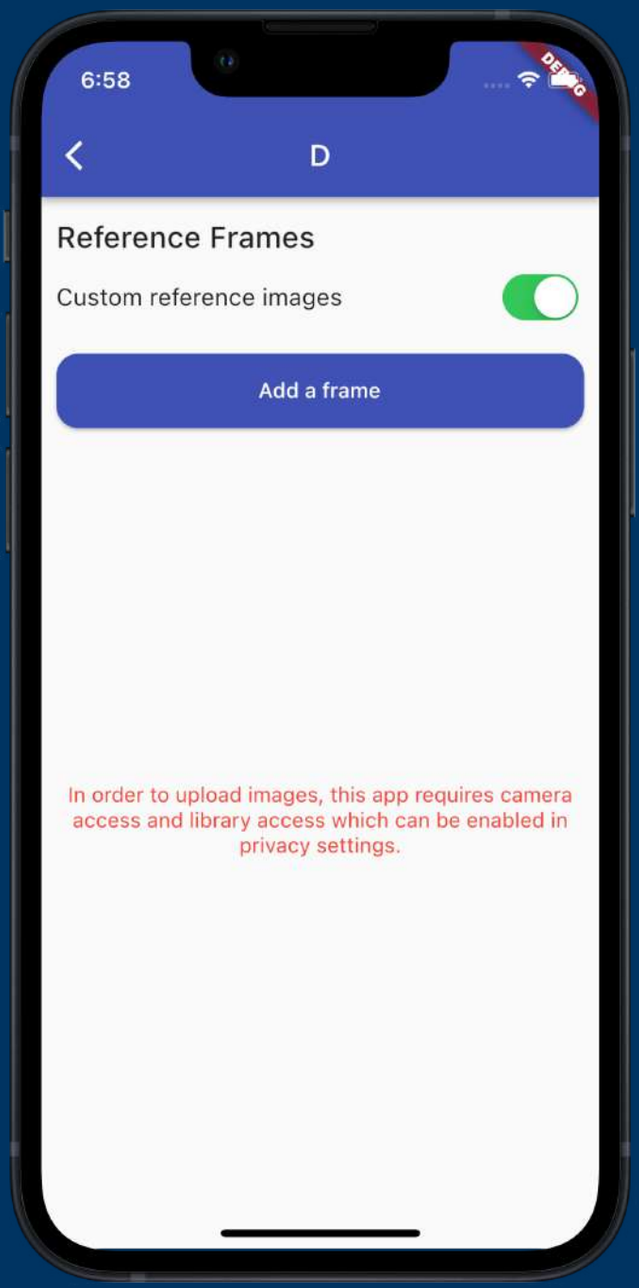
Custom reference images selection

Reference Setup Page

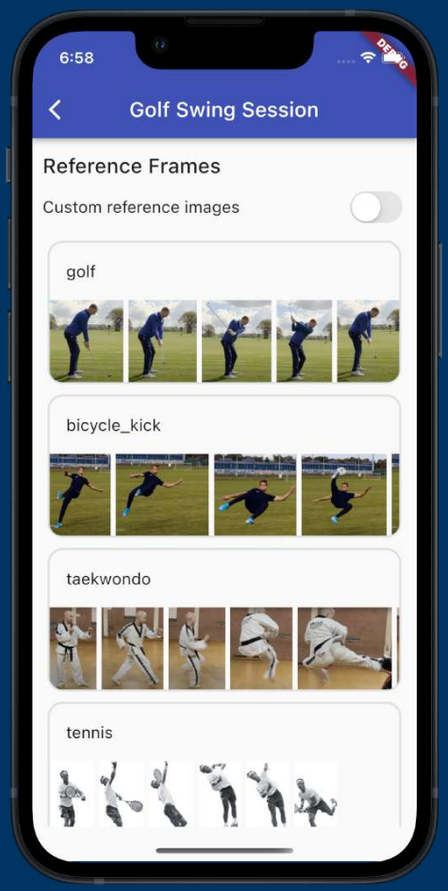


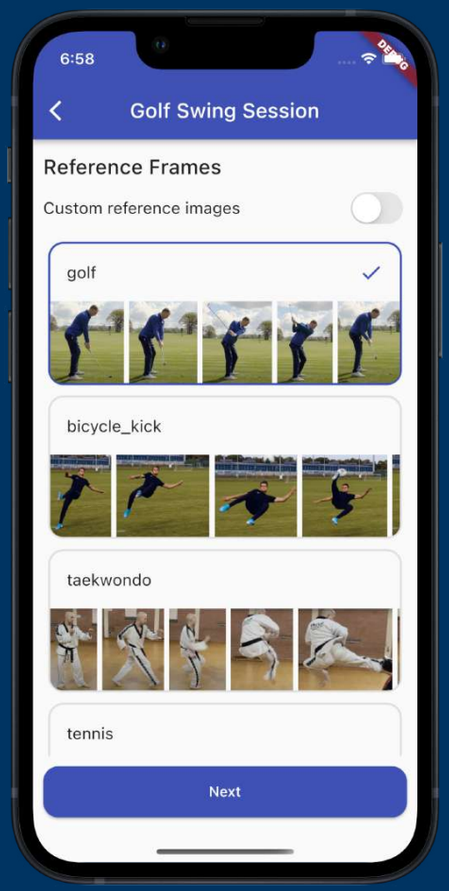
Custom reference images selection

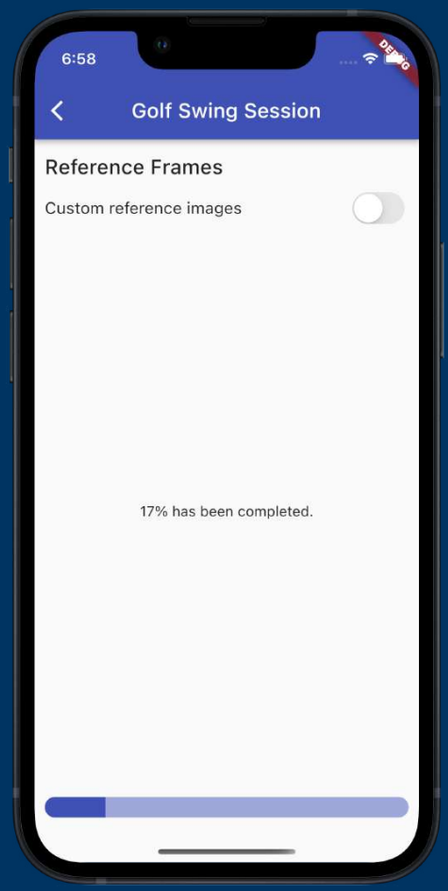
Reference Setup Page

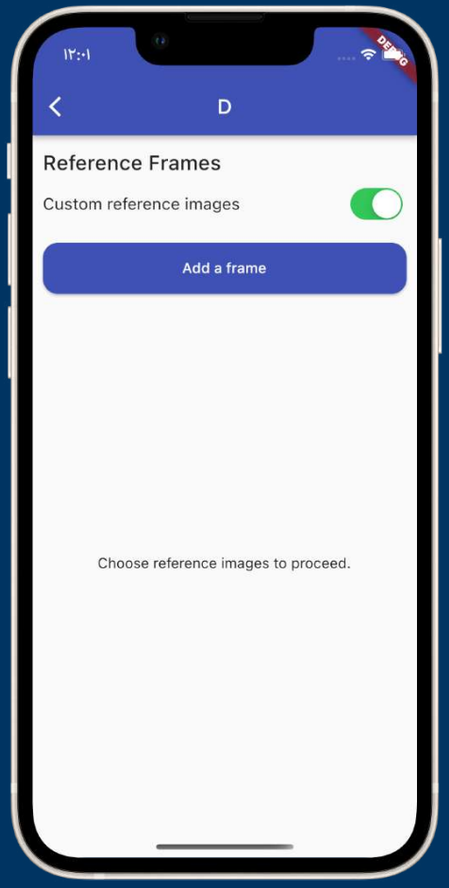


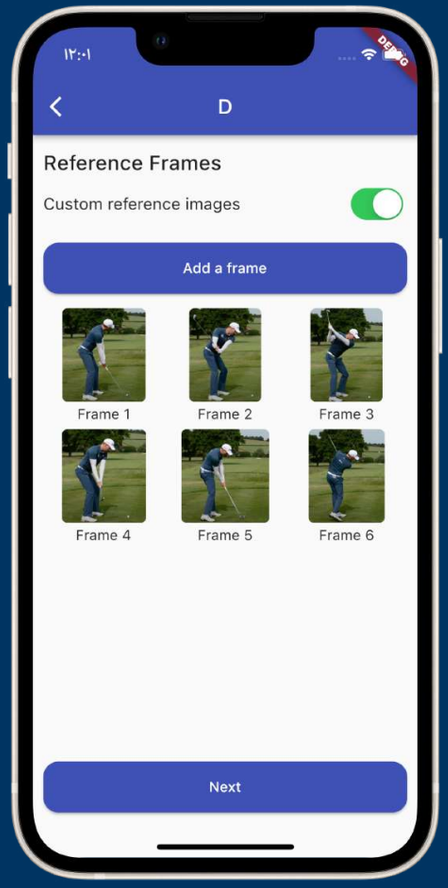
Permission Denial to Phone’s gallery


6:58
Golf Swing Session
Reference Frames
Custom reference images
golf
bicycle_kick
taekwondo
tennis


6:58
Golf Swing Session
Reference Frames
Custom reference images
golf
bicycle_kick
taekwondo
tennis
Next


6:58
Golf Swing Session
Reference Frames
Custom reference images
17% has been completed.


D
Reference Frames
Custom reference images
Add a frame
Choose reference images to proceed.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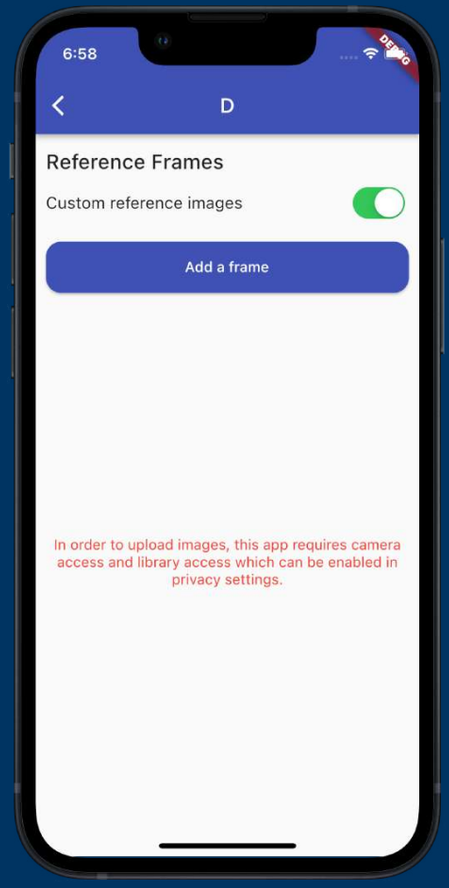
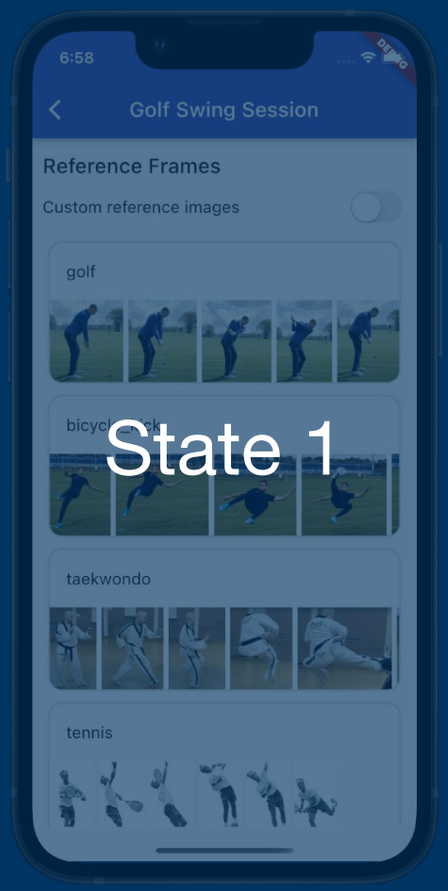
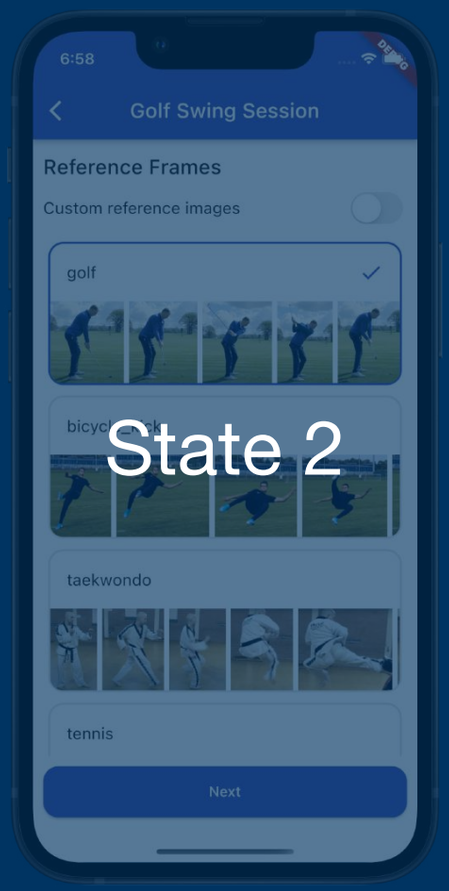
Reference Frames
Custom reference images
Add a frame
Frame 1
Frame 2
Frame 3
Frame 4
Frame 5
Frame 6
Next

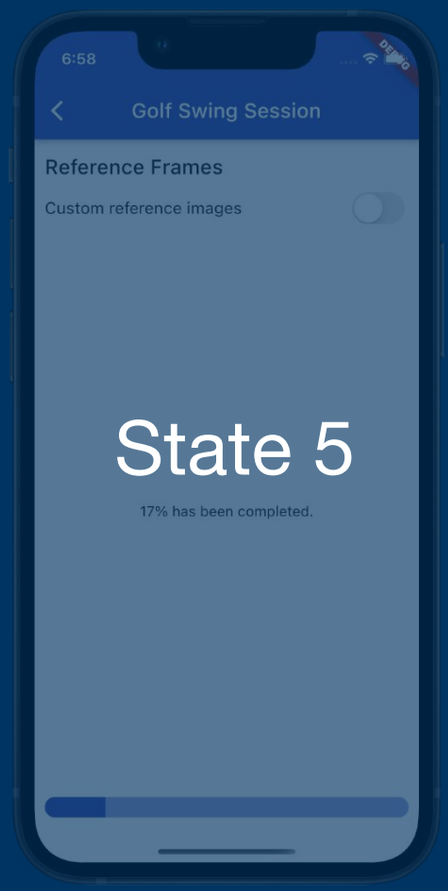

6:58
D
Reference Frames
Custom reference images
Add a frame
In order to upload images, this app requires camera access and library access which can be enabled in privacy settings.



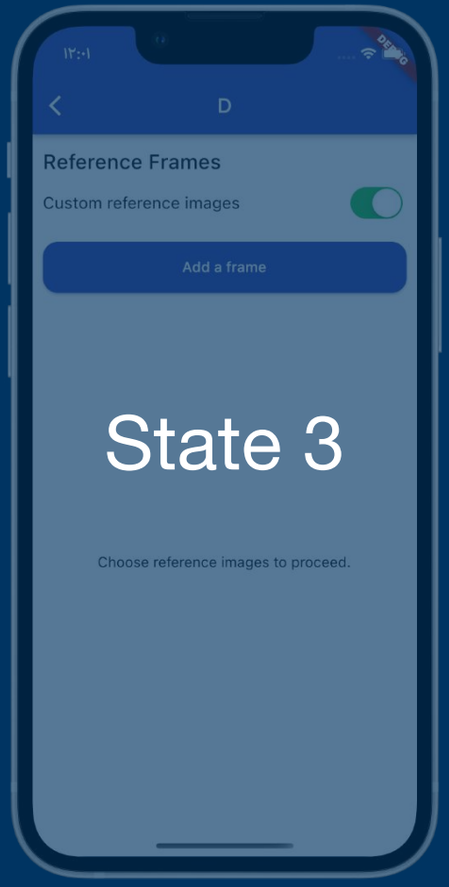
State 1



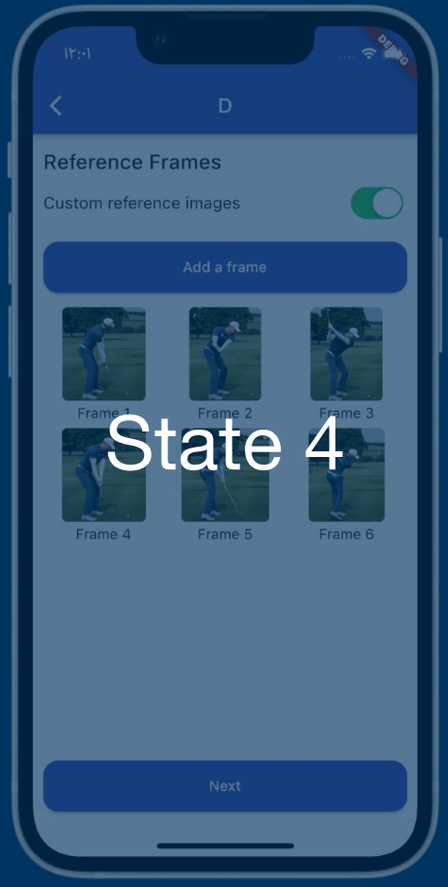
State 2



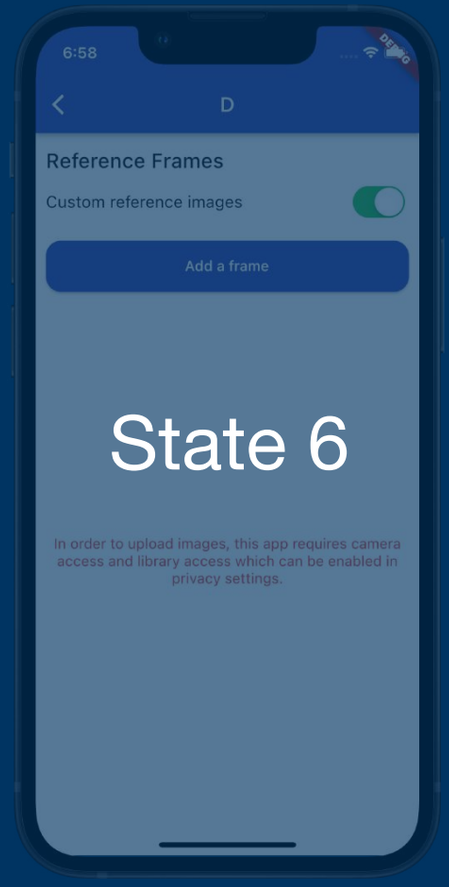
State 5



State 3



State 4



State 6

States and Logics

State 1 File Repository (Read)

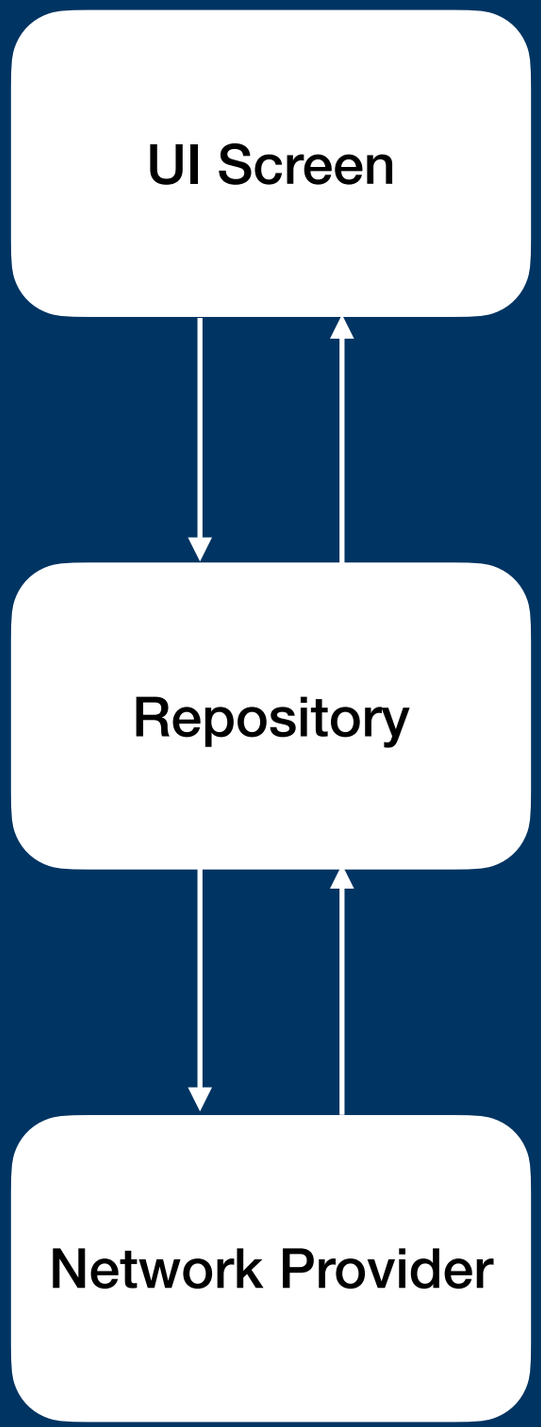
State 2 File Repository (Read & Write)

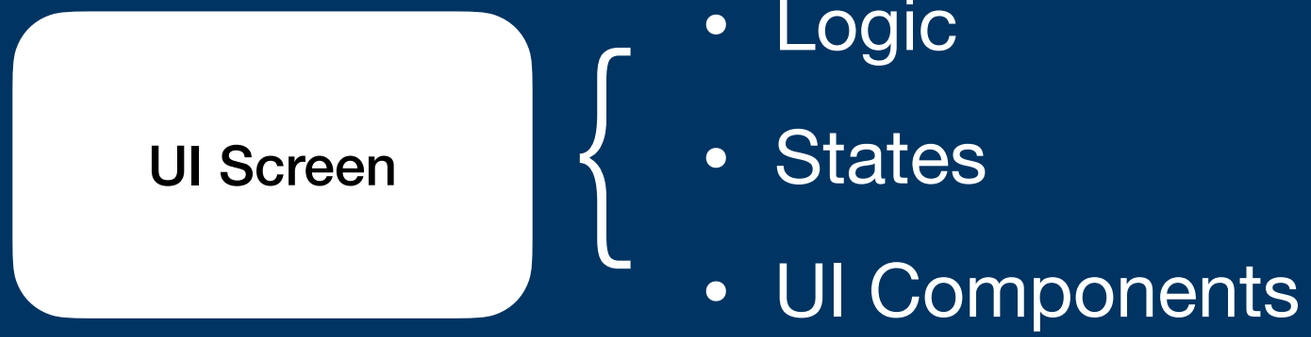
State 3 UI Related Logic

State 4 File Repository (Read & Write)

State 5 API Repository & Database Repository

State 6 System related Logic

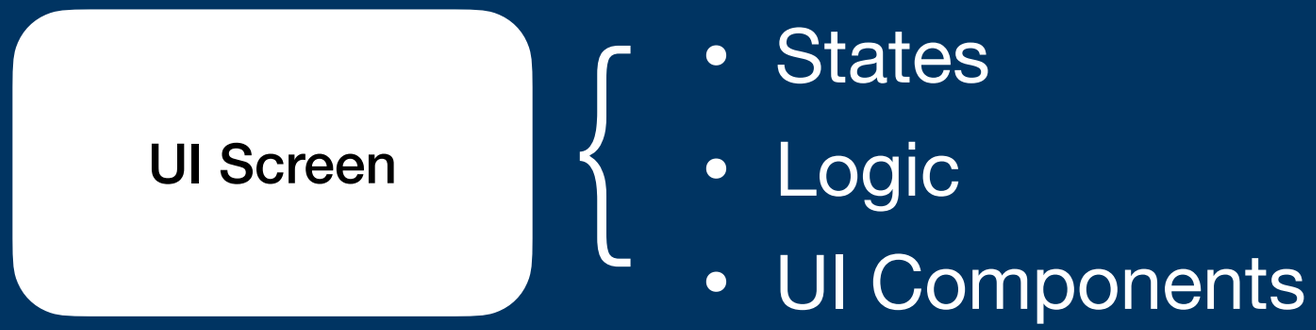

UI Screen
Repository
Network Provider


UI Screen
• Logic
• States
• UI Components

UI Screen
?
Logic
States
UI Components

Criteria for a Sustainable Architecture

- Clear Code
- Maintainability
- Testability
- Cleanness


UI Screen
• States
• Logic
• UI Components

?

- States

UI Screen

- UI Components

?

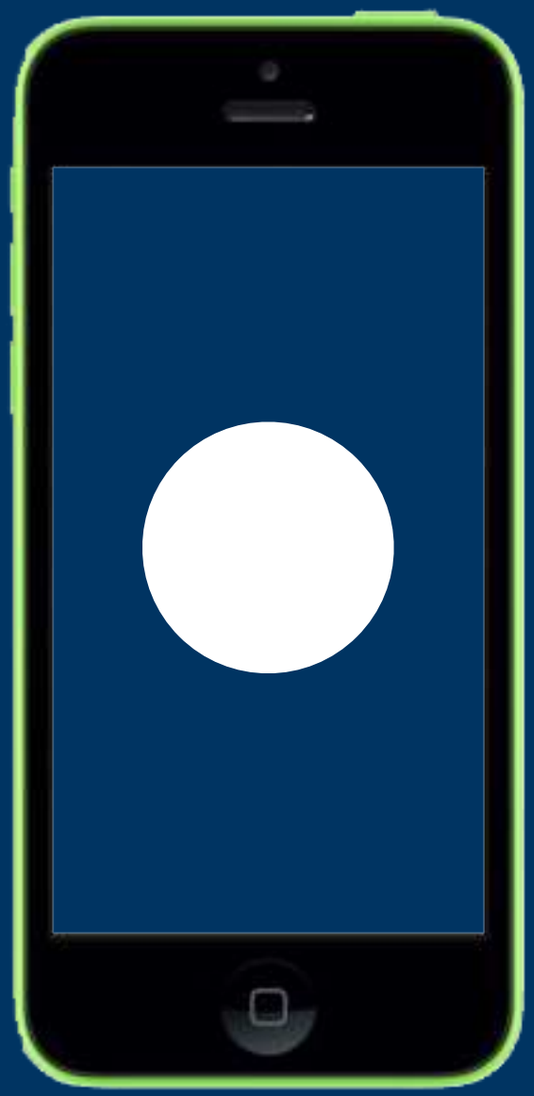
- Logic

BLoC

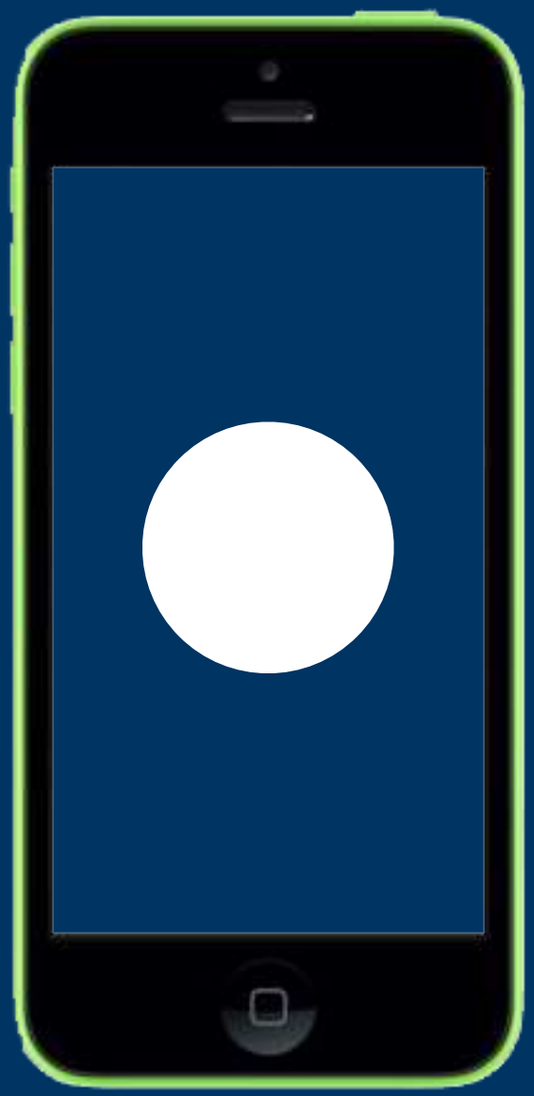
Business **Lo**gic of **C**omponents

- Bloc Class
- Events Classes
- States Classes

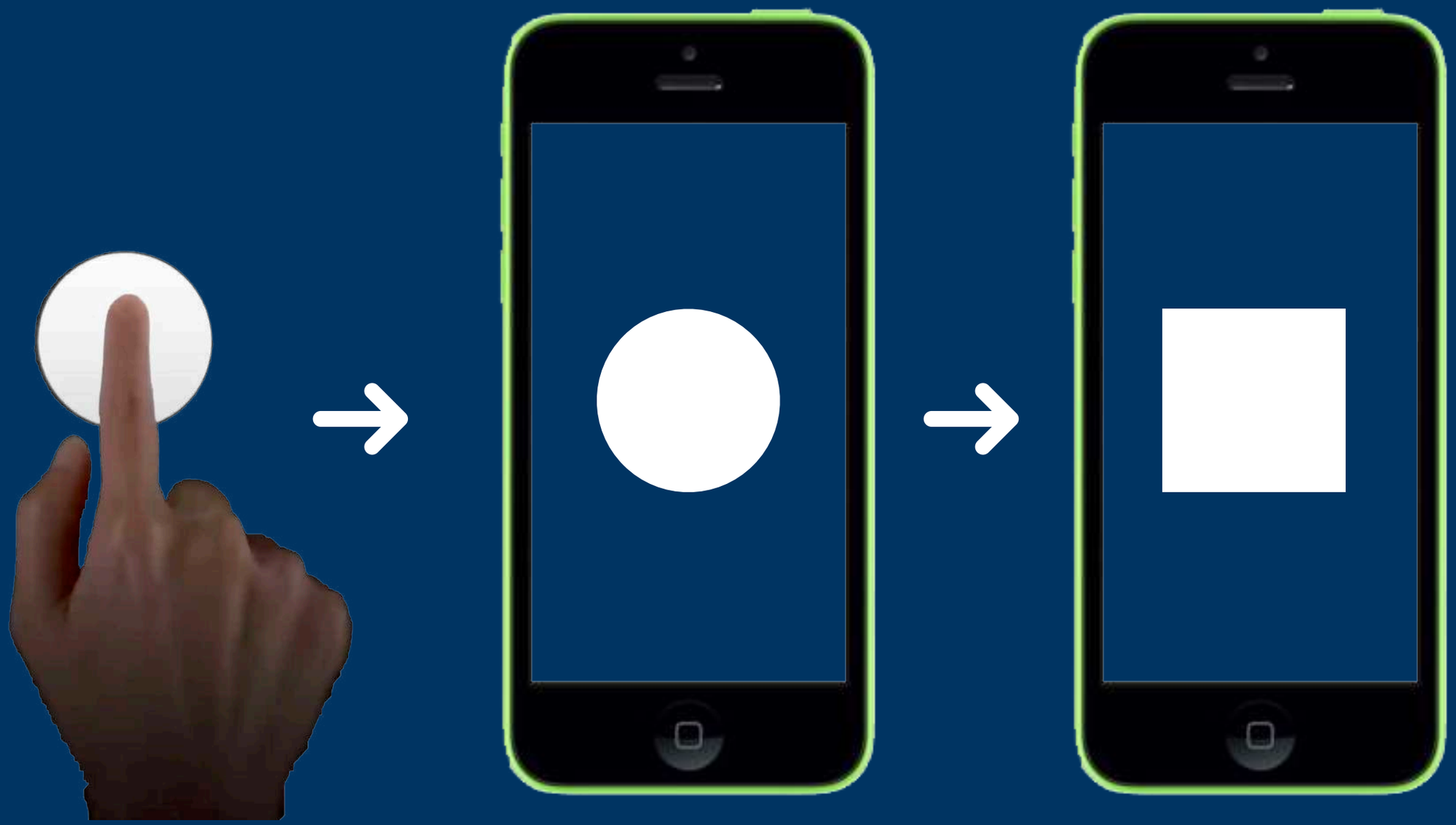
How does an interaction Work?

Events →  → States

How does an interaction Work?

Events →  → States

How does an interaction Work?

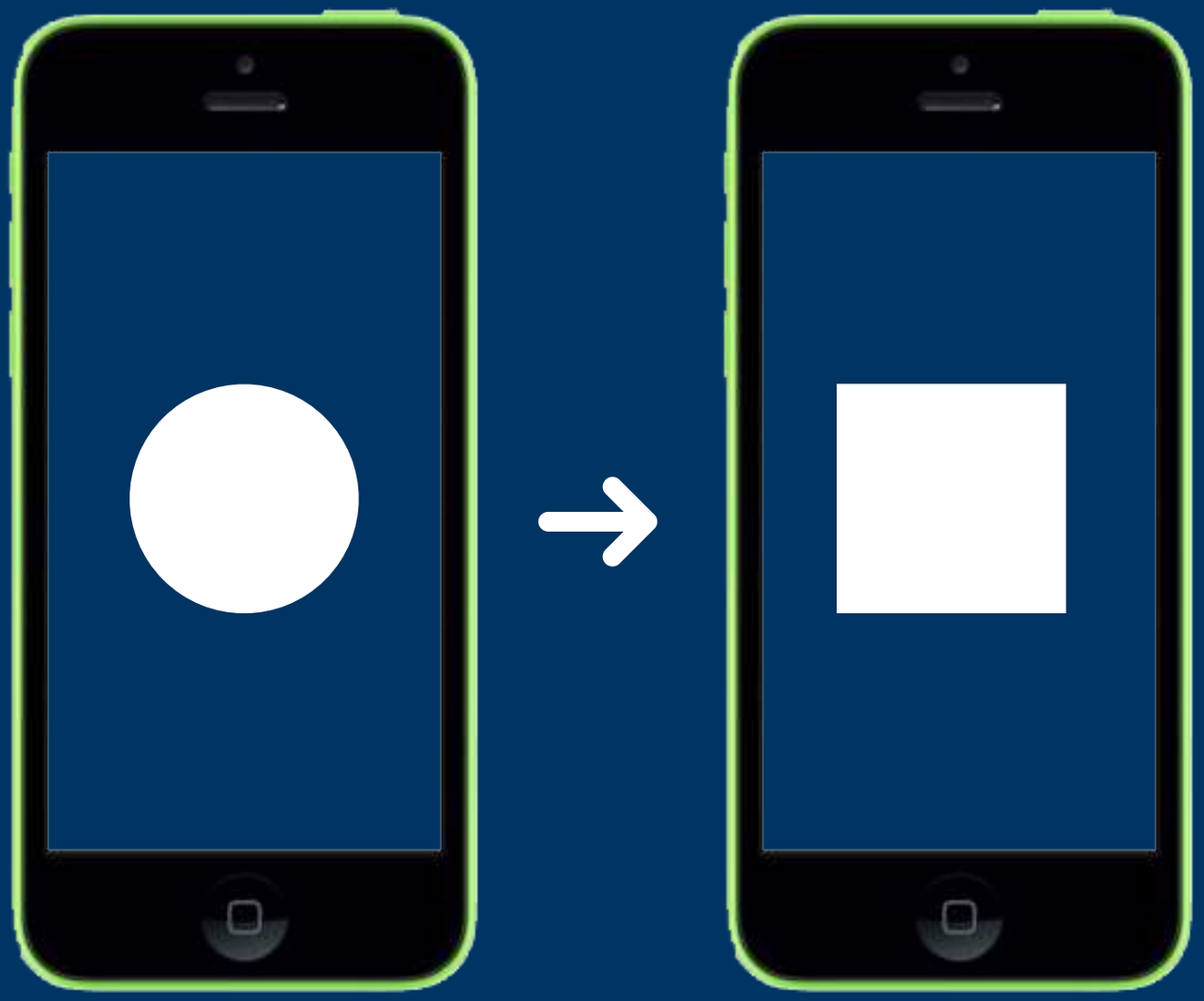


input

State Change

How does an interaction Work?

Events →



State Change

How does an interaction Work?

?

- States

UI Screen

- UI Components

?

- Logic

States

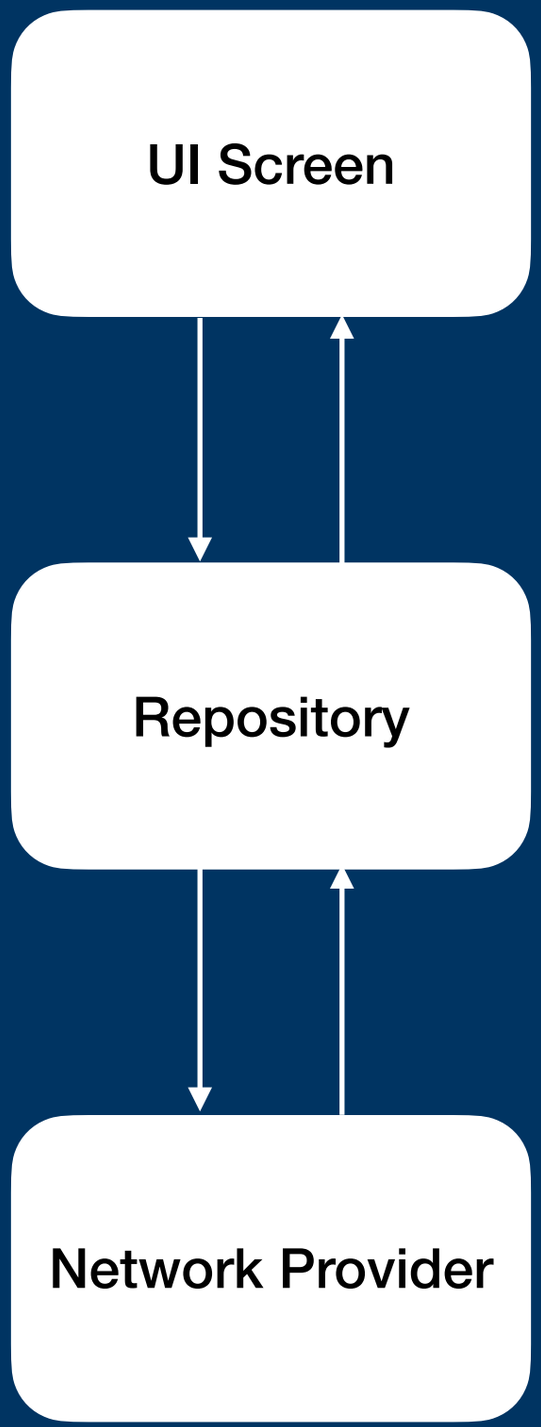
- States

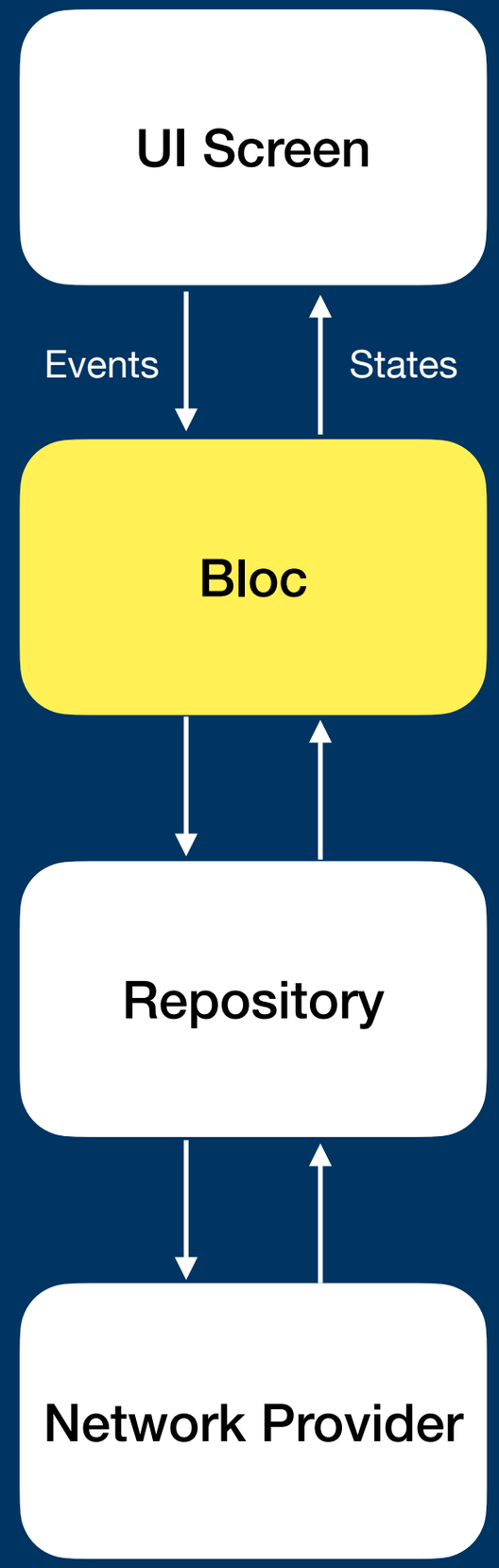
UI Screen

- UI Components

Bloc

- Logic


UI Screen
Repository
Network Provider


UI Screen
Events
States
Bloc
Repository
Network Provider

THANK YOU!