

Pose Embedding?

Translate



embed

embed

pose landmark to process ↓

$$\begin{bmatrix} u_1 \\ \vdots \\ \vdots \\ \vdots \end{bmatrix}$$

$$\begin{bmatrix} u_1 \\ \vdots \\ \vdots \\ \vdots \end{bmatrix}$$

Euclidean

distance

0.01

Goal Today, get image embeddings & similarity done

1. Preprocessing, just want 1k images, ensure images just have 1 person in them
2. Test embedding, make sure normalization works
3. Embed all images into files & crop so images just contain the pose
4. Create function that takes file, outputs files with poses similar to it

↑ needs to consider not just euclidean distance...

Goal, get all heads in the semaphore?

↓
or maybe not needed if I consider metrics...

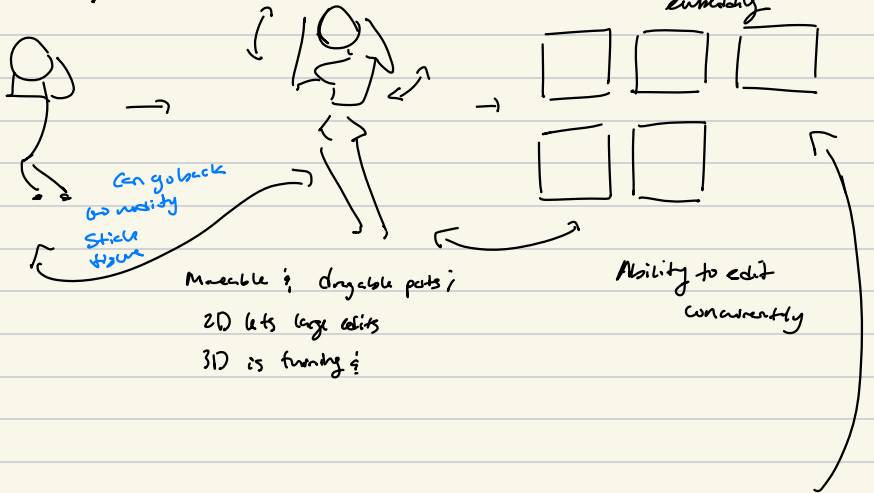
Pipeline

3/18/2026

Draw Stick Figure

3D Model Render

Find images closest to
embeddng



Right Now, Backend goals

1. Guide api to

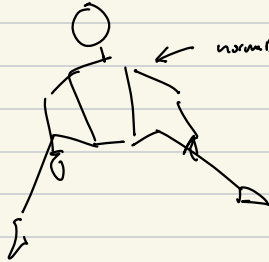
- 1) embed a large group of images/videos into ddb
- 2) Take a stick figure return 3D render
- 3) Take render return similar images from database

users can upload their own
data base; in order to save they need
to make an account & pay

3/18/2026



Should somehow normalize so the relationship between features is preserved



normalize shoulder & waist distance?

Similar angles instead?

processing pipeline

1) move all so landmark 0 is at (0,0)

1) Head

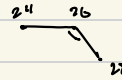
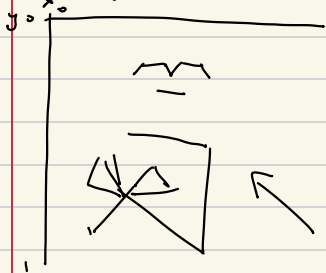
2) Colar bone

3) Waist

4) Angle of knee to leg?

5) Angle of legs

embedding is



replace w/ a different vector? Angle vector

1) Individual Parts

- head vector using horizontal & vertical line

- torso vector horizontal & vertical

12 to 11

24 to 23

angle

- legs knee angles 23 25 27

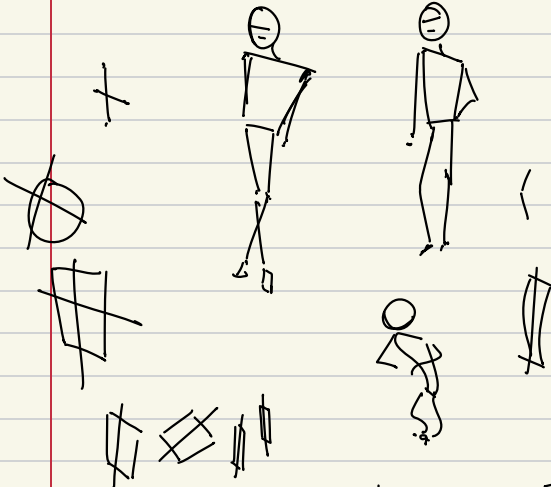
24 26 27

- arms elbow angles 11 13 15

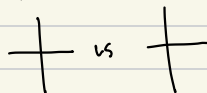
12 14 16

- leg vectors

- arm vectors



To Combine calculate weighted euclidean distance



very different...



1) Directions are similar

for each feature

Head $v_{8,7}$ $v_{10,9}$ $v_{8,10}$ $v_{7,9}$

Torso $v_{12,11}$ $v_{24,23}$ $v_{12,24}$ $v_{11,23}$

Legs $v_{24,26}^{L1}$ $v_{23,25}^{L2}$ $v_{26,28}^{L1}$ $v_{25,27}^{L2}$

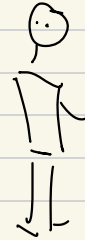
$v_{24,23}^B$ $v_{26,25}^B$ $v_{28,27}^B$

$v_{30,32}$ $v_{29,31}$

Arms $v_{12,14}^{A1}$ $v_{11,13}^{A2}$ $v_{14,16}^{A1}$ $v_{13,15}^{A2}$

$v_{12,11}$ $v_{14,13}$ $v_{16,15}$

Full Body $v_{0,24}$ $v_{0,23}$ $v_{0,12}$ $v_{0,11}$



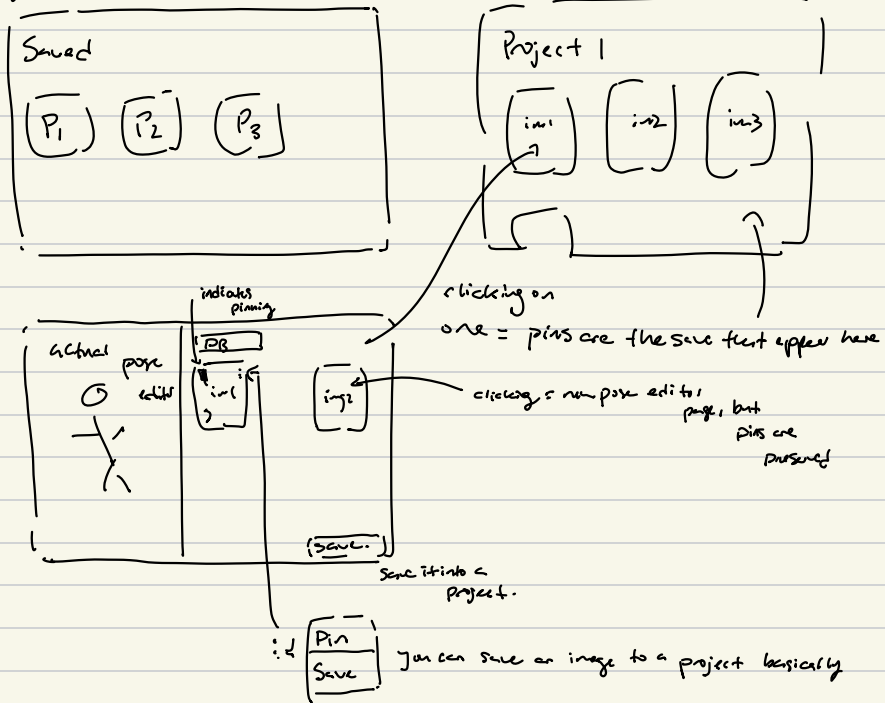
use xGudpmx's method to normalize vectors

3/19/2026

Take

3/21/2026

Systems Design

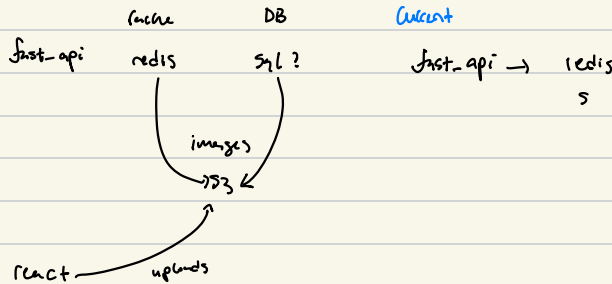


Add function to calculate mathematical crop based on points

3/22/2026

Designing the fast API ?

Data stuff



"/upload"

↳ create dataset id

↳ preprocess *Future prevent nudity & multiple people postframe

↳ Loop through processed images

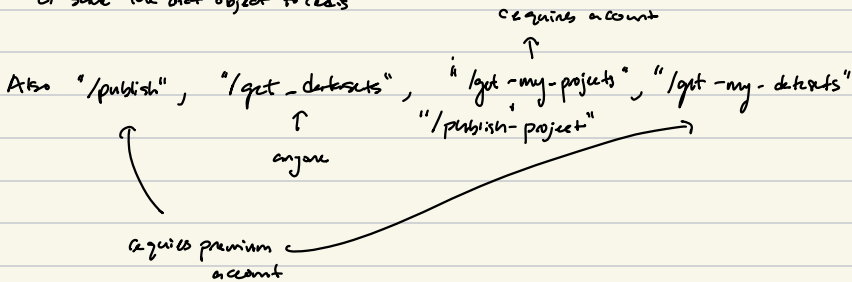
↳ upload image to S3 → I have to setup the S3 image storage

↳ embed the pose

↳ save the dict object to redis

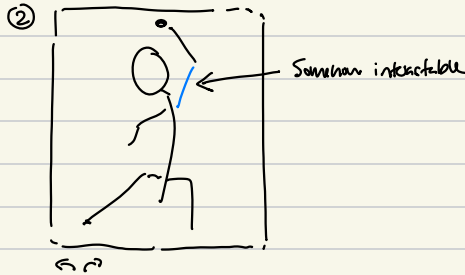
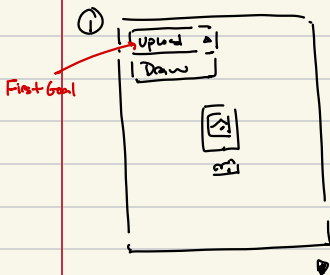
"/search"

- uses the filename to



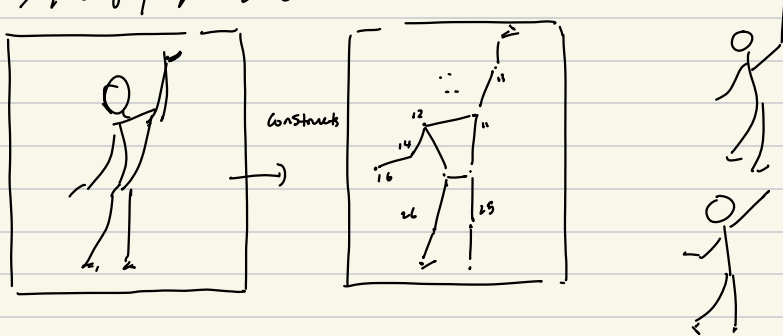
pose search user pipeline

① upload ② edit



Create a pose context to save previous pose embeddings

3/28/2026



Pipeline

1. Take image extract binary matrix
- Get slightly area points & return pose guess
2. create model &



np matrix

Create Fake Sketches

- 1) Connect joints to make skeleton w/ all the features available
- 2) Apply variations 2 easy 3 medium 1 hard
 - i) Line variation
 - ii) add missing parts
 - iii) add noise
 - iv) curvature
 - v) perturb joints

Hard

6 5 4 1 2 3
8 . . . 0 . . 7
10 . . 9

Construct ellipse with $r_1 \quad \vec{87/2}$
with $r_2 \quad 2 * (\frac{41}{2}) \cdot 0$
acc $\vec{807}$

Torso

$\vec{1211}, \vec{1224}, \vec{2423}, \vec{2311}$

Legs

$\vec{2426}$ etc

Easy = Stick figure

Medium = Stick figure + Circles at joints + randomly draw additional lines on some lines + curve

Hard = line variation + missing parts + noise + curvature + everything

some
circles & joints

3/29/2026

Transfer Learning

1. Test out creating fake skeletons w/ pose data
2. Create small crappy model, see if it has any power
3. Apply pipeline to bigger dataset

Geometric
adaptor

1. Use fake & real sketches?
2. Try to decompose pose landmarks w/ heuristics

weighted
average



1. Jitter points

2. Render parts

Joints:

Add Circles to

14, 13, 26, 25, 12, 11 joints selectively

Head:

Construct ellipse with $r_1 = \frac{87}{2}$

with $c_2 = 2 * (\frac{41}{2} \cdot 0)$

$\frac{1}{2} \arccos \frac{807}{807}$



Torso:

The thinner the rectangle, the more circular

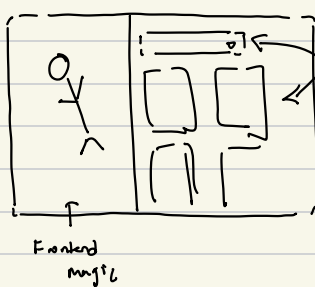
Legs & Arm: add extra lines

Add longer lines for 12-11, 24-23

3/30/2026

1. Model has promise...
2. Fix pipeline & make data cleaner
3. Api

base page
'/'



- needs
- "dataset/search/:id" with username if there returns top 10 if it comes with a page input it filters & sorts
 - "/datasets" gets all the datasets for that available.

- edit "/dataset" upload new page data into dataset & done corresponding page temp + permanent

dataset?

- ability to save pins to project = making an account needs userid

- 1) page datasets 2) page name/location id available

- create temp dataset
- create permanent dataset = requires userid



- add permissions like so need

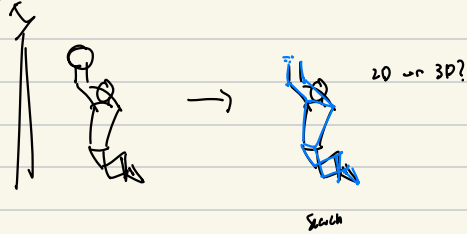
For Pages thumbnail

1. Create
 - temp - perm from temp
 - perm
2. Edit
 - temp
 - perm
3. Read
 - returns all perm + temp datasets
4. Delete
 - delete temp dataset

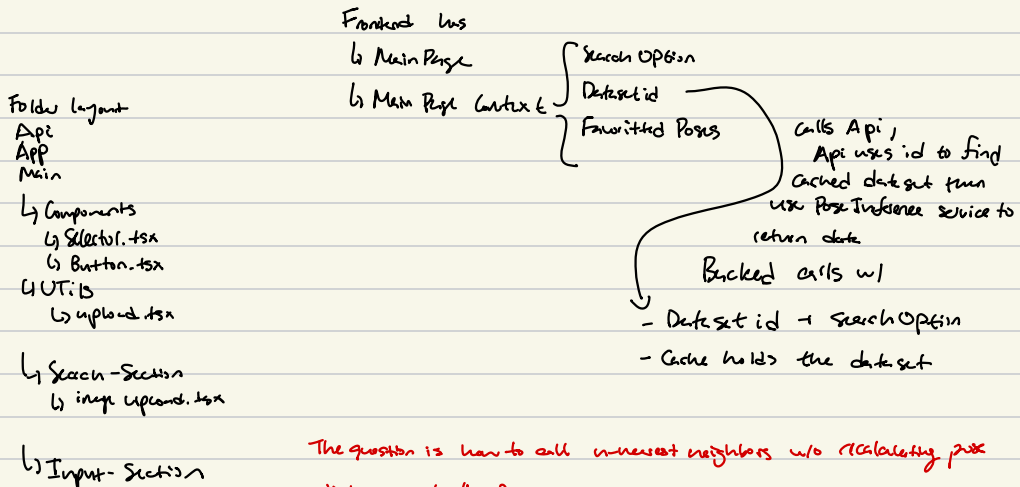
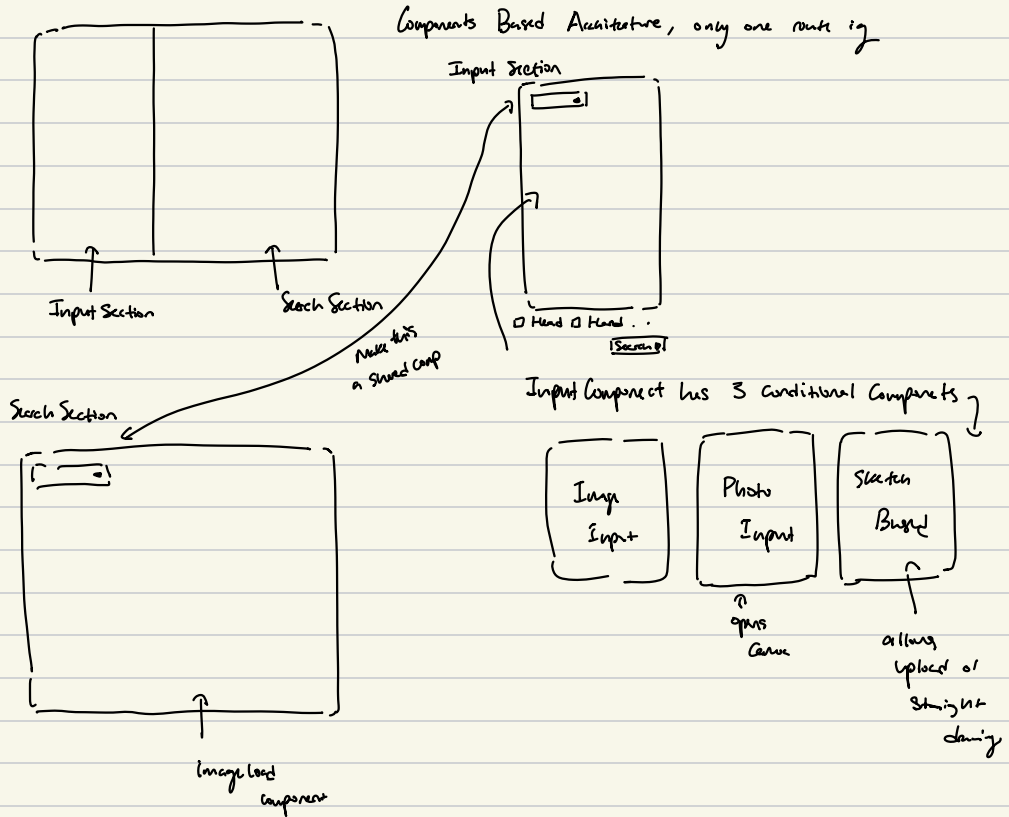
1. Create project only using perms
2. Edit
3. Read
 - returns all projects
 - read + id returns project page data
4. Delete

- Filter w/ joints $\leftarrow$ Basically fronted angle

- If they draw additional objects tell user that might mess w/ the model



4/11/2026



Clarified pipeline

1. Dealing w/ image data & uploads

Frontend

↳ upload new image in Form Data

Backend

↳ receive file

↳ have a convnet service / processig service

↳ run embedding or inference model

by in memory dict now
python dicts

2. Frontend Context

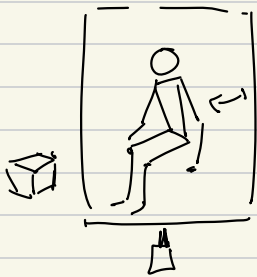
No heavy embeddings in the frontend

↳ datasetId

↳ favoring

↳ Search History

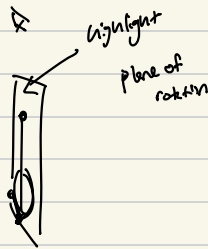
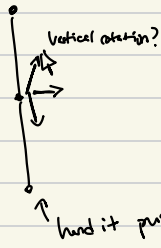
4/22/2026



pipeline

- Skeleton Canvas. tex
- Skeleton, influenced by controls
- Controls
- Edit mode allow joints to drag back & forth
- Search, tex, takes coords translated by camera

operations:



- endpoint, hands, feet, head can be stretched & pushed, I will do the rest to accommodate that

- otherwise everything is rotated internally -- need to maintain realism; ability to select multiple & rotate

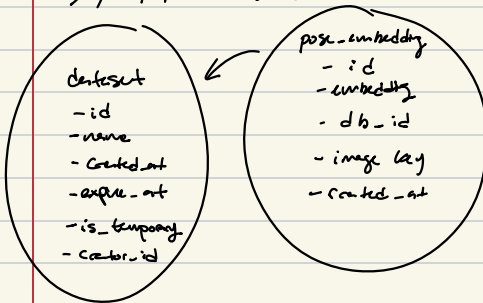
- easy snaps for quick use

4/30/2026

Questions to Answer

1. What is allowing the joints to move & be degable
2. How exactly does the calcification work for joints that are being moved in the chipped joint
3. How do fixed joints work
4. What is the motion

5/4/2026



Potential? returns id, then get all pose-embedding objects
- match done on embedding-5?

Figured data representation, next simulate it in notebook

5/5/2026

Flex box

