A-Shot

Innopolis University
2024

Which one is better?

Easy!
Right?

Which one is better?

A bit harder?

Which one is better?

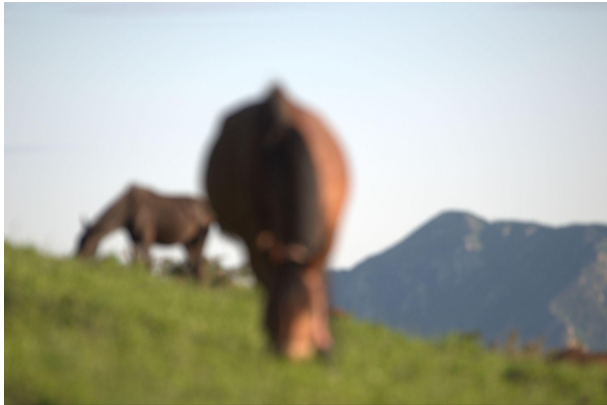CULLING 1000 PICS

IMPOSSIBRU!

How is it usually done?

Usual culling procedure

People are bad at multitasking, so culling is done in multiple steps

Step 1
Quick review

Identify any obvious rejects, such as blurry images, incorrectly exposed photos

Step 2
Detailed review

Check for sharpness, composition, lighting, and expressions

Step 3
Narrow down further

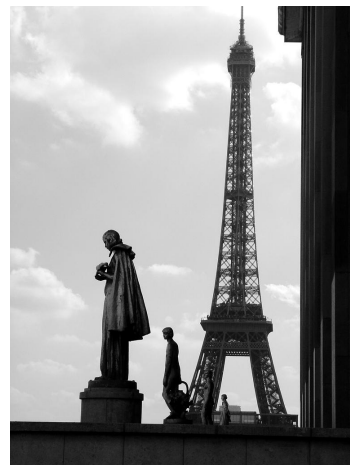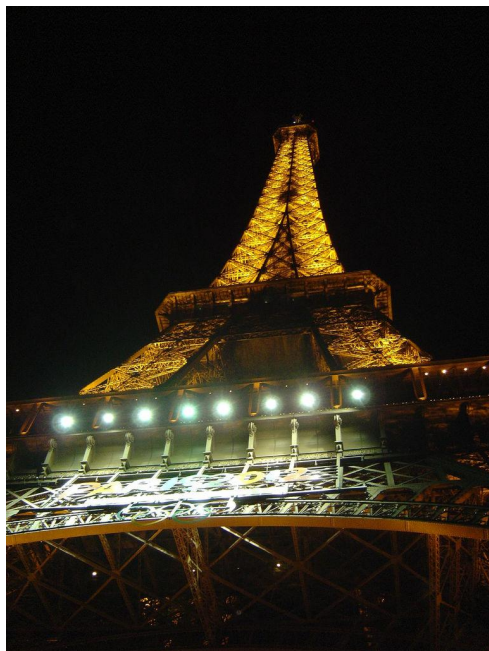Go through the selected photos, select only the best ones

How can we simplify
the process?

Challenges

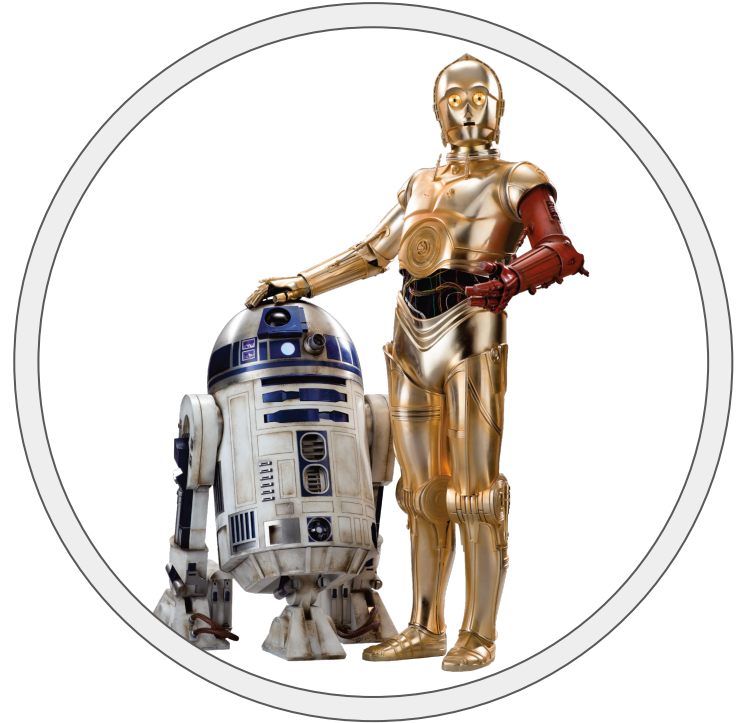It is hard to distinguish harming and good blur

Criterion of a good photo might be controversial

Our principles

Don't replace people

Do assist people

Our principles

Going from mess

To organized structure

Step 1: blur and wrong exposure

We can automatically detect blurry or poorly exposed pictures. Now, instead of 100% manual sorting, a person might just need to check for occasional misdetections!
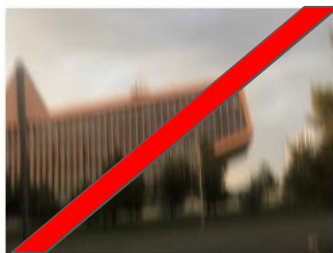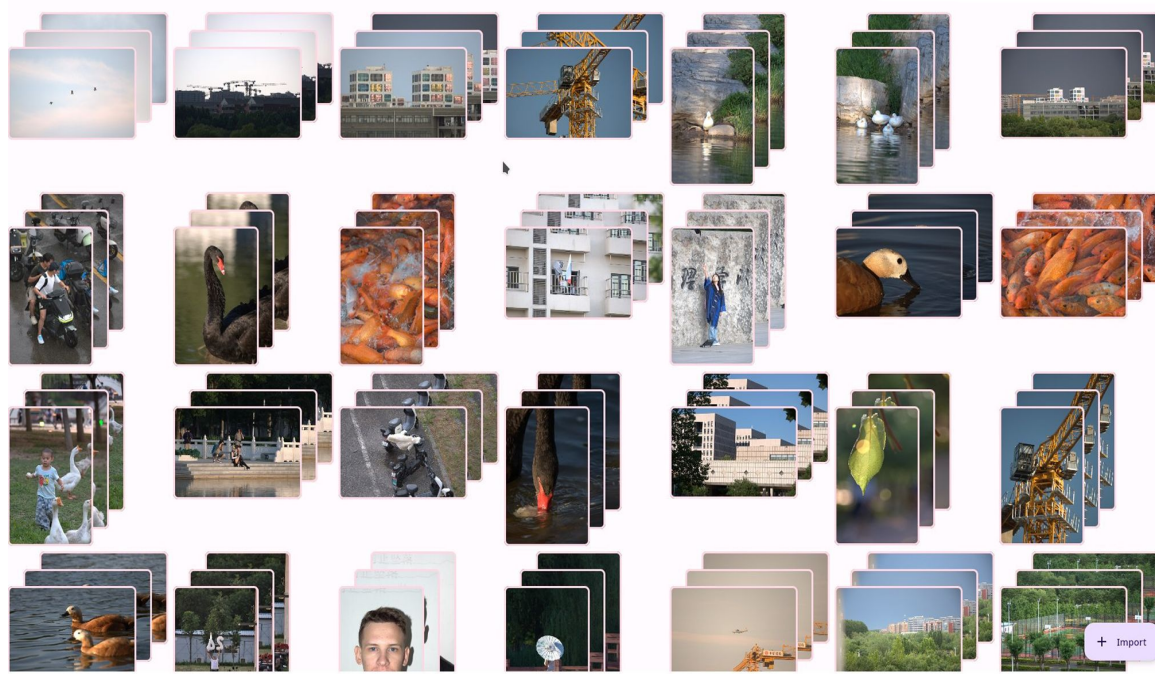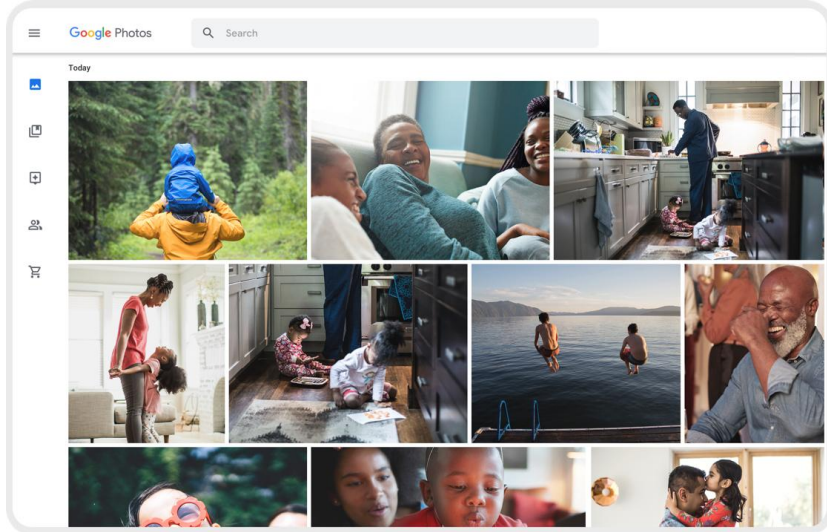
Step 2: grouping similar pictures

Grouping similar pictures can significantly simplify the culling procedure by reducing visual clutter, enabling quicker comparisons, eliminating redundancies, and highlighting unique images.

Existing solutions

GooglePhoto

Tonfotos

Licensing options and prices

Free license	Personal license	Family license
Free	**$39**	**$99**
No time limitations	1 user/device	Up to 5 users/devices
Full functionality of paid version	Perpetual License	Perpetual License
Limited number of people on photos	Unlimited number of people in your photos	All the benefits of a personal license
Anonymous usage statistics helps us make product better	You can disable the collection of anonymous usage statistics	Information about the persons in the photo is automatically synchronized between users
	Priority email support	Can be installed simultaneously on different operating systems
Free Download	Buy Tonfotos	Buy Tonfotos

✖ only 15 GB for free

✖ no blur detection

✖ network connection required

✖ tool for deleting duplicates

✖ no blur detection

Existing solutions

PictureEcho
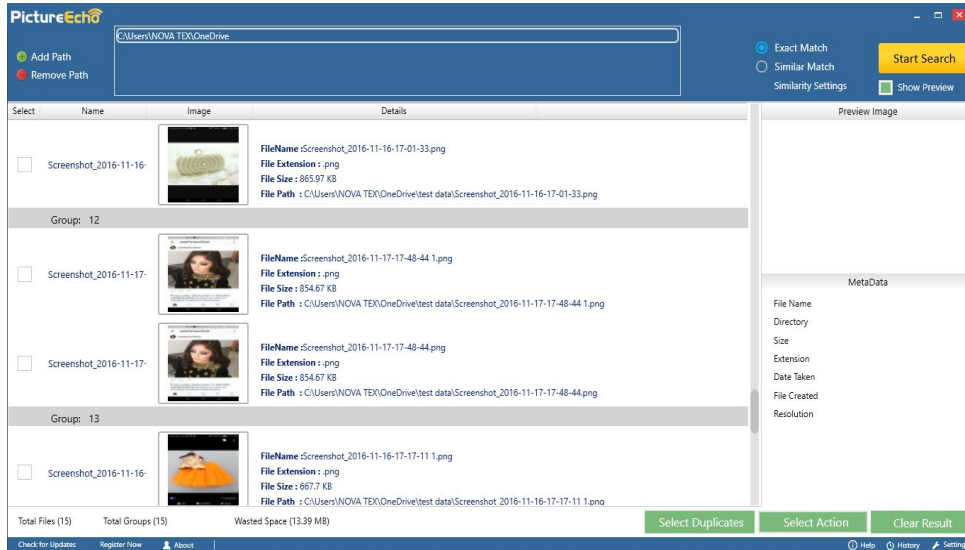
Capture One

✖ outdated design
✖ no blur detection
✖ partial multiplatform
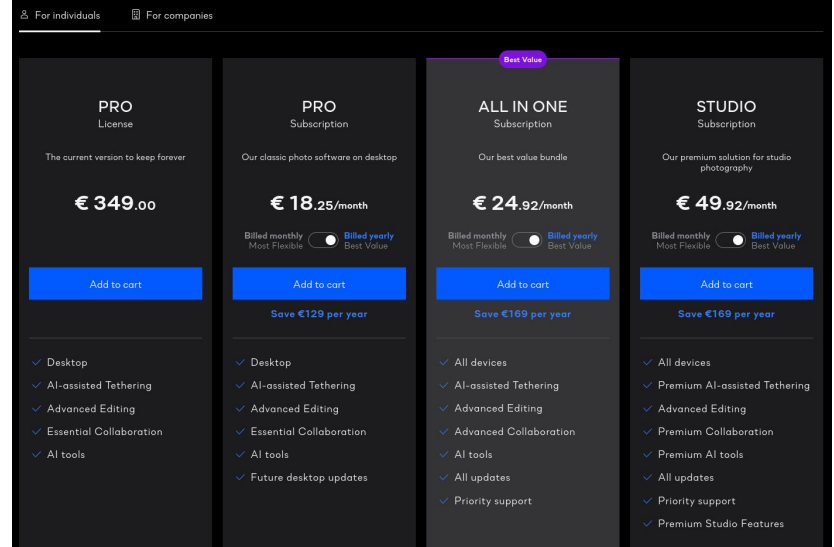
✖ only 30-days free trial
✖ no blur detection
✖ partial multiplatform

Our Team

Nikita

Full-stack developer

Timofey

ML Developer

Artur

ML developer

Artemii

Team Lead, ML, Full-stack developer, DevOps, PM

Egor

Frontend developer

Matthew

Product Manager, UX/UI, Frontend dev.

Mikhail

ML developer, Toaster

A-Shot

Multiplatform

Server-free

Lightweight

~1GB
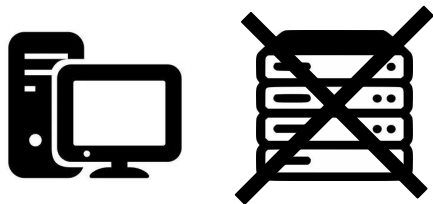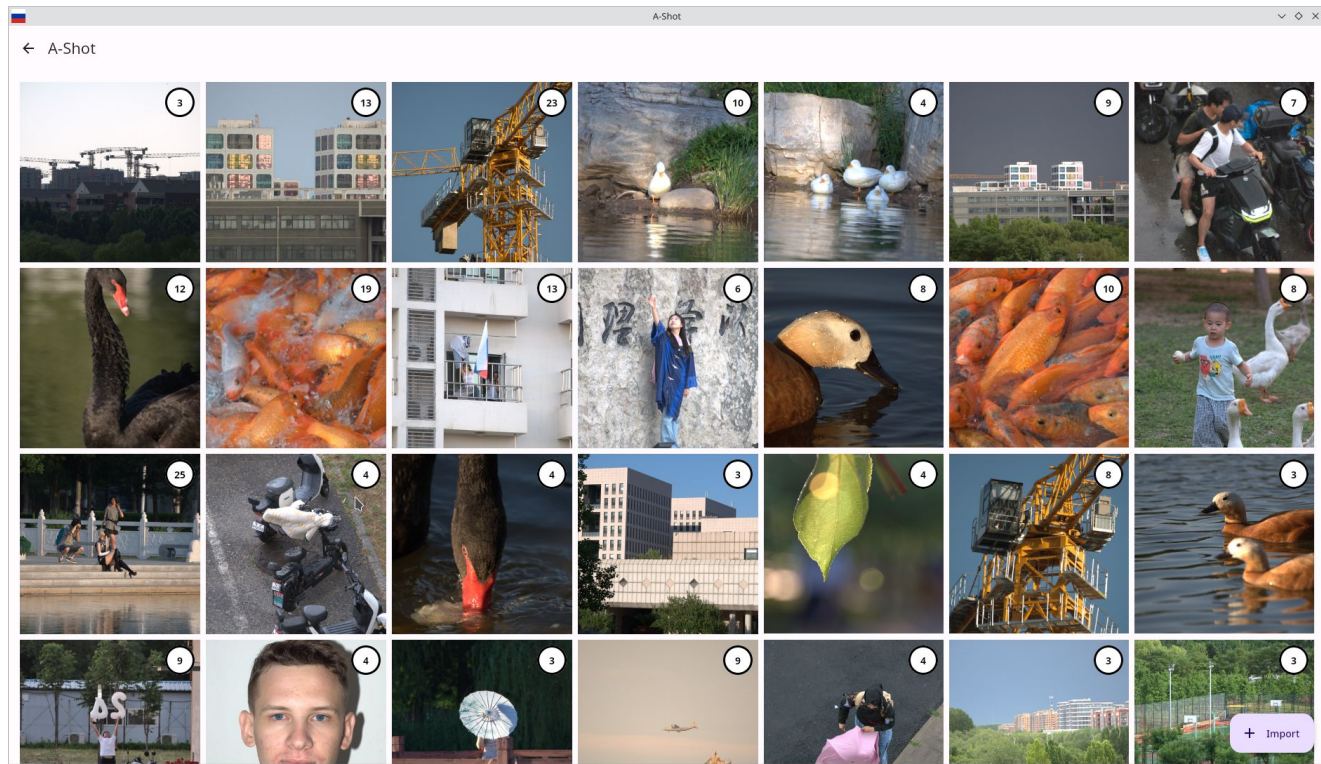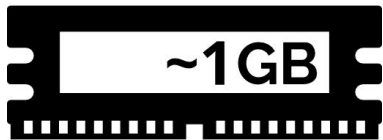
Tools we applied

Image Magick

Jetpack Compose
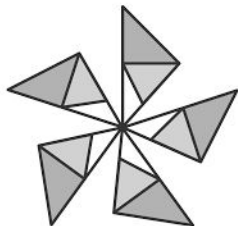
Kotlin

ONNX
Runtime

PyTorch

Material
Design 3

Blur detection

Laplacian method is the most popular method, that finds the variance of image gradient map. However it shows poor performance with homogeneous regions. After a research we have found a promising solution: **D-DFFNet**.
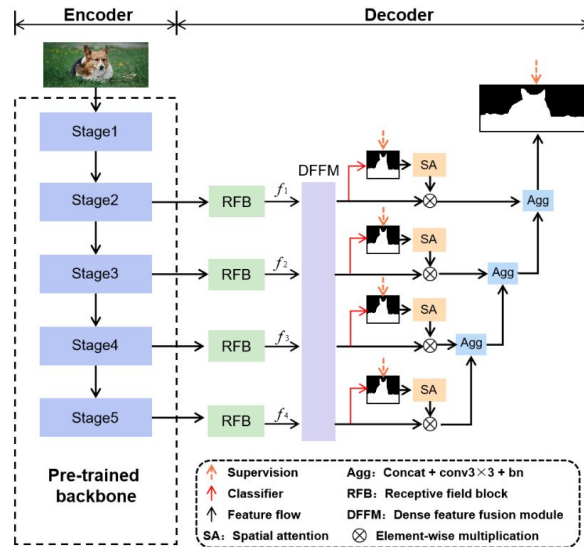

Homogeneous regions

defocus blur image

sharp patch | sharp patch | blurry patch

(a) Images | (b) DBDF | (c) LBP | (d) HiFST | (e) BTBNet | (f) CENet | (g) BTBNet2 | (h) AENet | (i) EFENet | (j) DD | (k) DeFuNet | (l) IS2CNet | (m) D-DFFNet | (n) GTs
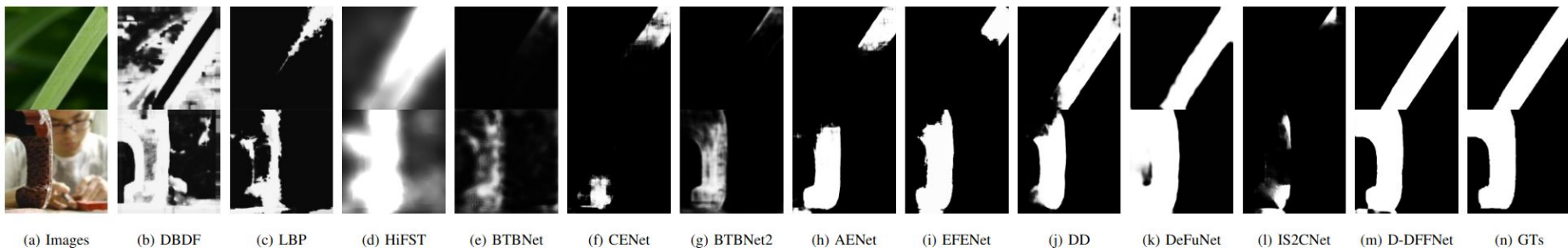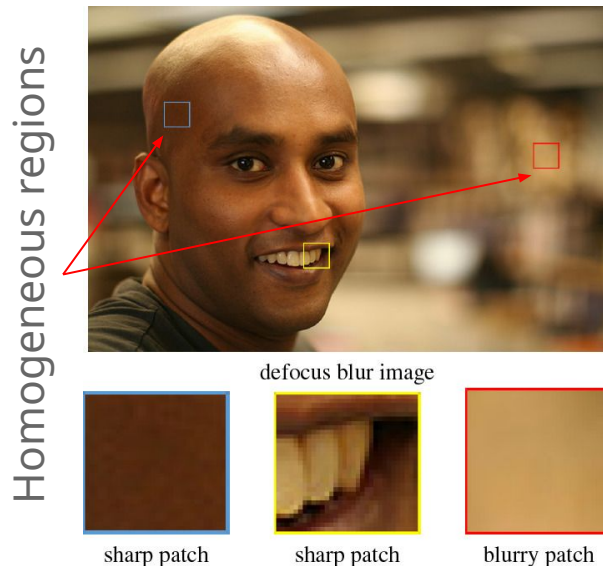
Blur detection

Step 1	Step 2	Step 3	Step 4
Image input	D-DFFNet	Blur map	Decision

How can we determine blurry image?

We can modify a NN to do this, but for MVP just pixel averaging is used

Image grouping

- Group by timestamps?
- Imagine a jet appearing in the sky during the landscape photography

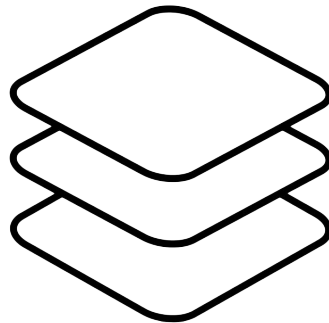These pairs of pictures are made within 1 second

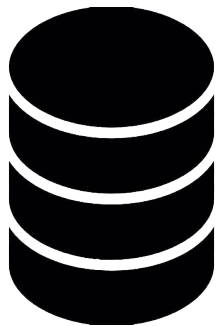# Image grouping

Step 1
Image input

Step 2
SuperGlobal Net
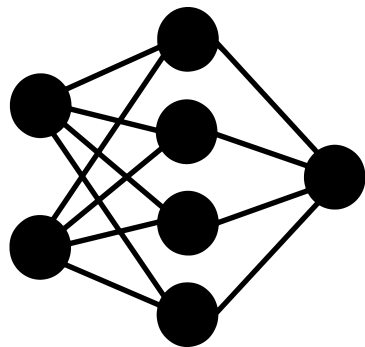
Step 3
Embedding

Step 4
Database

Image grouping flow

Step 1
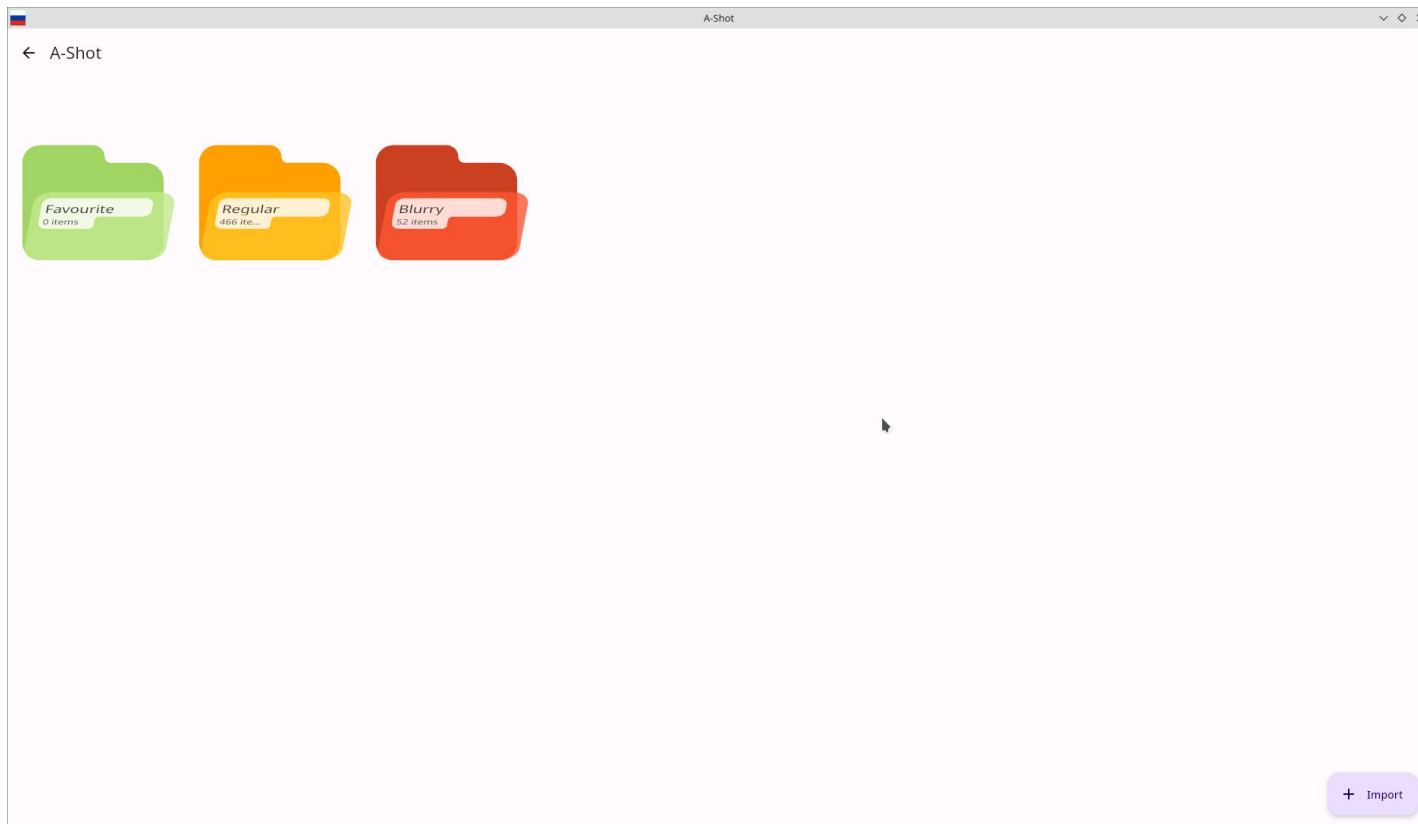Database

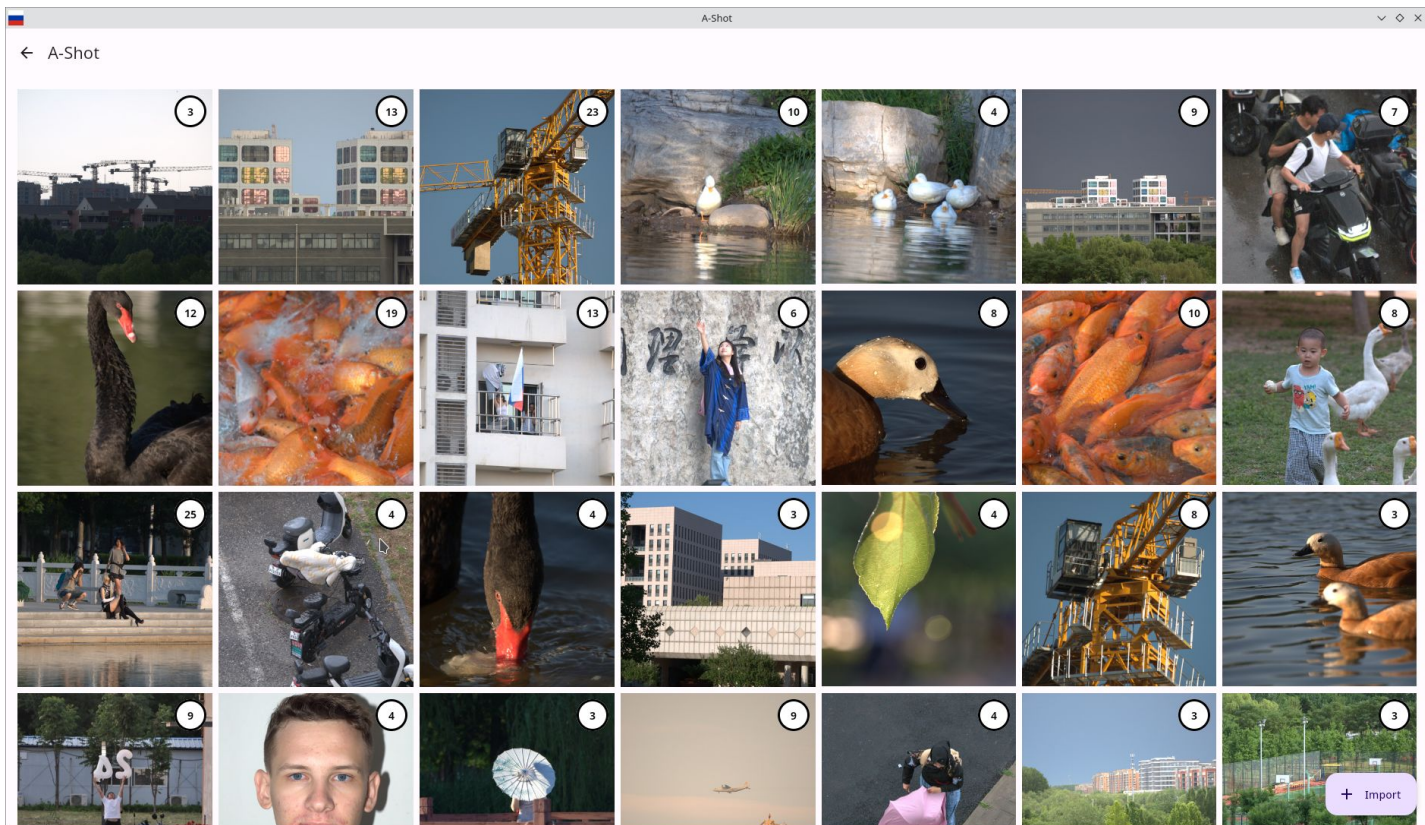**Step 2**
Embeddings
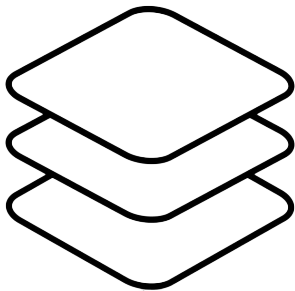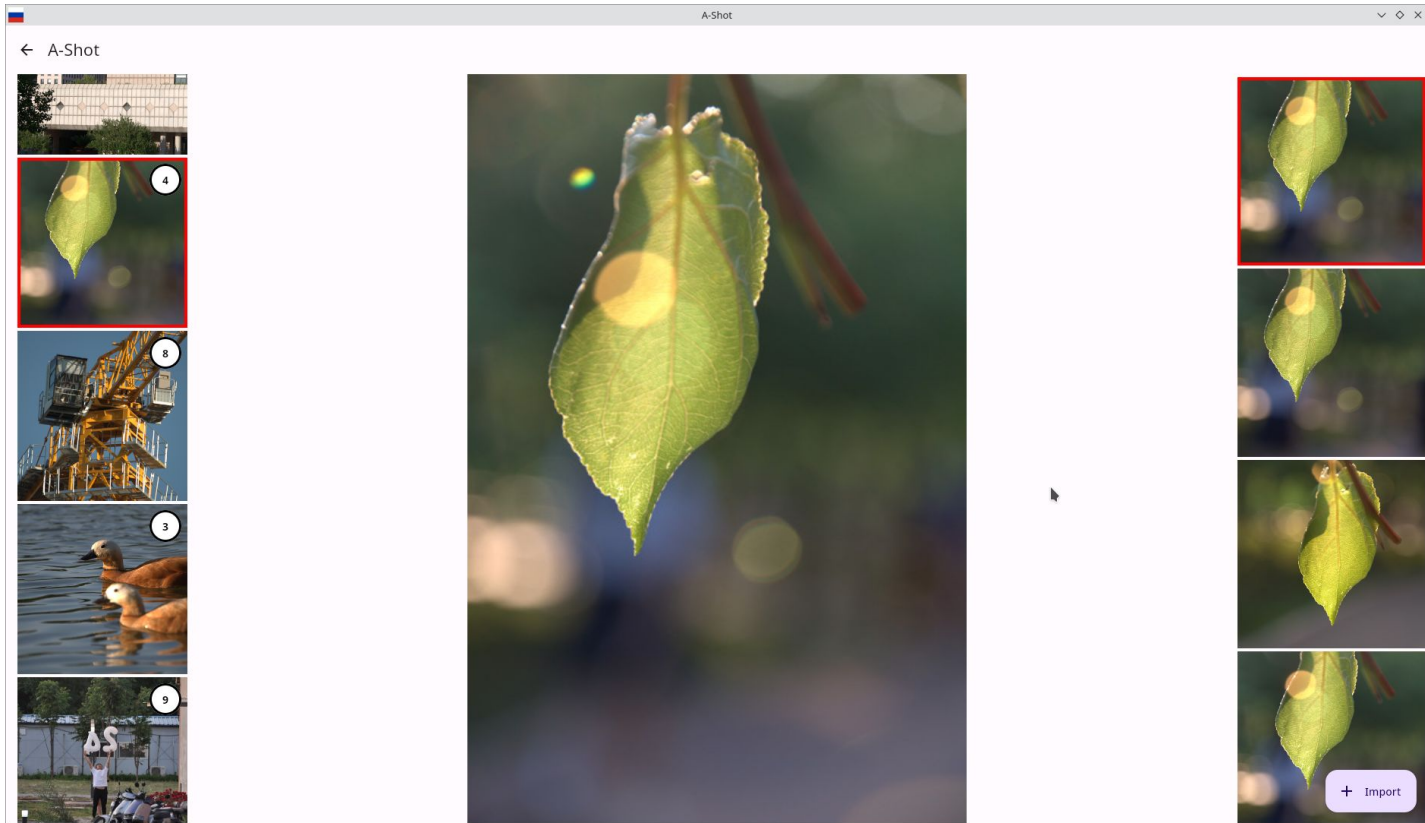
Step 3
DBSCAN
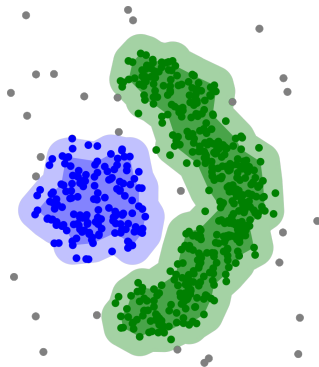
Step 4
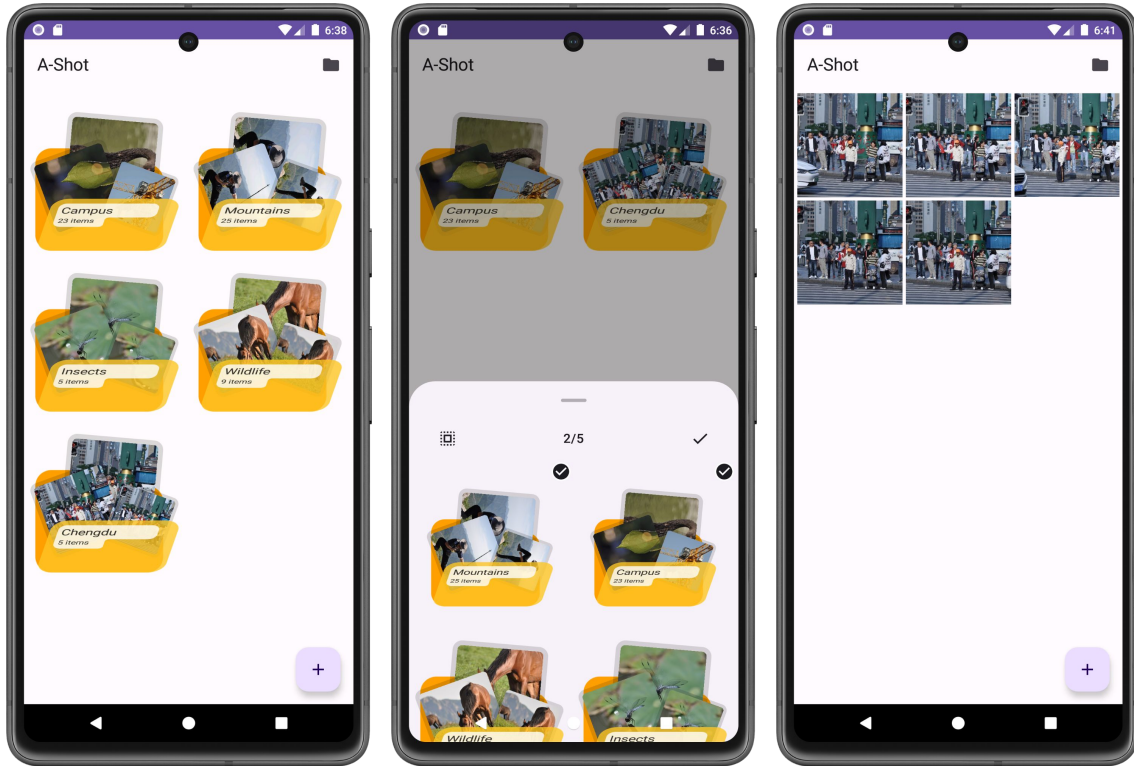Grouped images
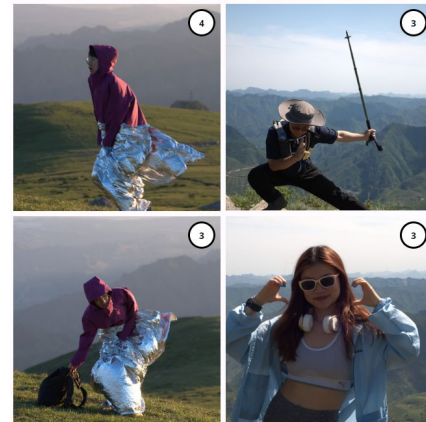
System UI
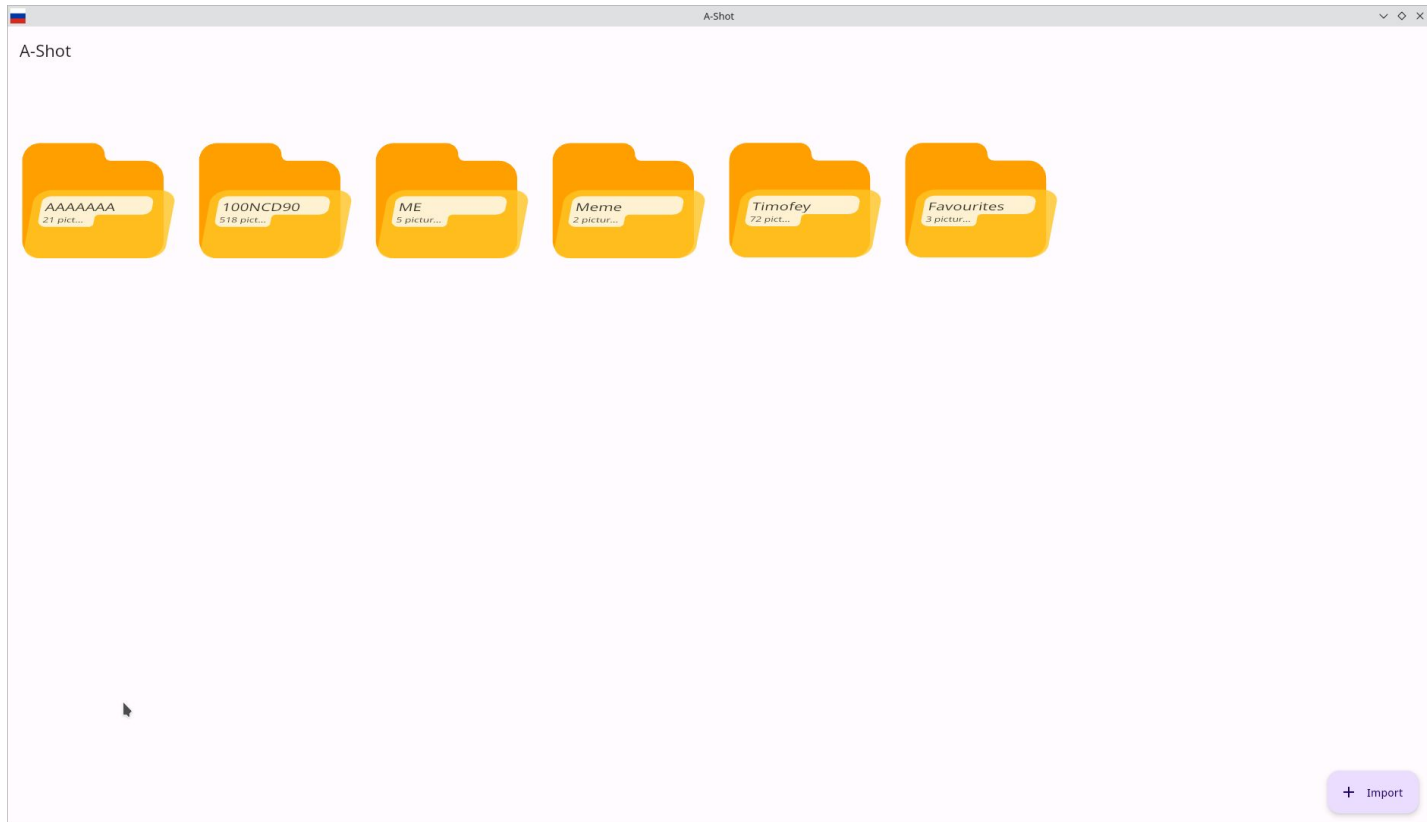
System UI

System UI

System UI

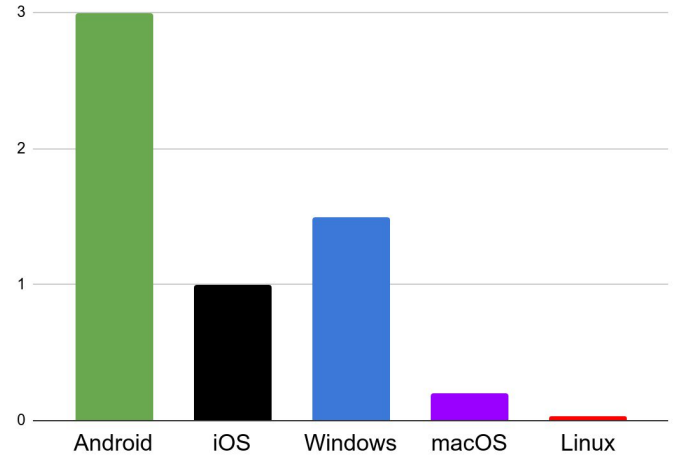# Future
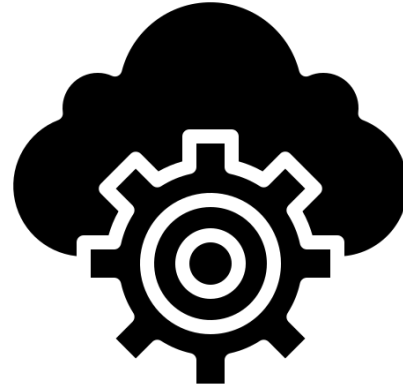
Mobile Application

~4 billion more users

Paid Cloud Services

Cloud Storage

Storing sorted photos in the cloud – helps users to organize images and free space on local machine

Cloud Computing

Processing images may take a while on a poorly performing machine. Cloud computing will speed up the process and enhance the UX

Advertisement

Analyze shots and exif info

Give Contextual AD

A-Shot

← A-Shot

Seems like you love macro photos

AstrHori

25mm F/2.8 MACRO 2X-5X

Thank you for attention!

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