Table of Contents

Image cutting

Information extraction

Marketing related

Existing products

1, https://www.molemap.net.au/

Molemap
Provide services:
A clinic, provide mola mapping, follow-up, skin check.
They use handheld camera and take picture part by part.

2, https://miiskin.com/

Miiskin
Provide services:
Using an APP, take picture of back.

3, FotoFinder bodystudio ATBM

https://www.fotofinder.de/en/technology/skin-cancer-detection/bodystudio-atbm/master

-almost same design compare to DermoX2
-advantages:
Movable camera
Also take pictures part by part. It may get better resolution.

-Already asked for demo pictures.

4, Vectra WB360

46 stereo vision pods, Proprietary Xenon Flashes, 3D Cross-polarized Lighting

For the camera design

1)

For the camera we might use, we can find its Angle of view. We can also use camera simulator to see the results in different parameters.
Includes: camera, lens, Focal length, F-number, distance of the person and background

See the results.

The hardest way is to use this data and put them to 3D modelling software.

2) Some thoughts:

Requirements for Camera

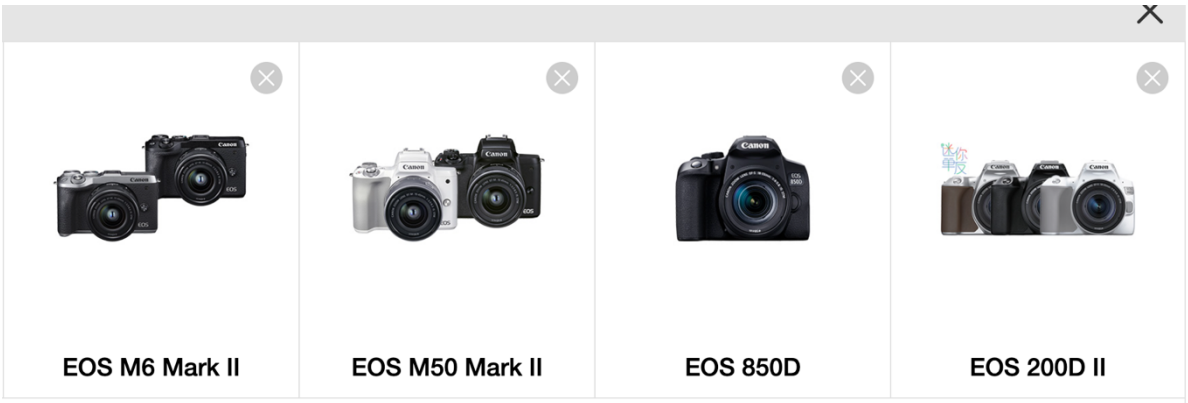
-resolution
-remote switcher
-power(battery? Line?)

-continues working ability

1. decide what types of cameras. Brand.

Example: Canon EOS M200 with lens. (around AUD700) 24MP

Important



-Should be able to use remote switcher
-200D II, yes, 24.1MP(4000 X 6000) aud829(with lens)
-M6 mark ii, yes, 32.5MP(4654 X 6982), aud1200(only body)

2. how many cameras.

Question : the image resolution level. If we want to make sure every mole can directly go into the model, then we need lots of cameras. Around 40 – 50 cameras (vectra used 46 camera pods and that's 92 cameras.)

Also if we need take all images in one shot, the amount of camera is large. Example image.

3. Motion. Camera track slider is not expensive. As for safety, we can have a shell on that. This is a solution to reduce the number of cameras.

4. About how to combine the images. Maybe we can put some tapes in several position (no mole area), and use these as an index to combine images

Line on background..

5. sensor size and resolution
https://www.masterclass.com/articles/how-image-sensor-size-affects-the-quality-of-your-photos#6-ways-sensor-size-impacts-your-photos

https://capturetheatlas.com/camera-sensor-size/

https://expertphotography.com/camera-sensor-size/

https://vst.co.jp/en/glossary/sensor-size-pixel-size/

6. dermoscopy sensor and resolution
7.

3) Unity3D
4) SketchUp trail now

For infographic

[12:33 am, 16/01/2022] Dr Reza: You will find relevant wording and info in here
[12:33 am, 16/01/2022] Dr Reza: The outcome for businesses (customers/partners) through the B2B business model is as follows:
1. Improved lost time injury (LTI) and loss of productivity by 20X
2. Health care (diagnosis/treatment) cost reduction by 4X to 43X
3. Reducing insurance premiums for employers
4. Reducing the compensation claims and insurance profitability

https://res.mdpi.com/data/data-02-00030/article_deploy/data-02-00030-v2.pdf

https://www.aihw.gov.au/getmedia/0368fb8b-10ef-4631-aa14-cb6d55043e4b/18197.pdf.aspx?inline=true

https://www.google.com/search?q=average+treatment+time+of+skin+cancer&rlz=1C1GCEA_enAU811AU811&sxsrf=AOaemvIIjxa7I6k6qAMvnUKLF-BWbVi55w%3A1640658858117&ei=qnfKYd3CBpKTseMP1Ne8iA0&ved=0ahUKEwjdv73DuoX

1AhWSSWwGHdQrD9EQ4dUDCA4&uact=5&oq=average+treatment+time+of+skin+cancer&gs_lcp=Cgdnd3Mtd2l6EAM6BwgjELADECc6BwgAEEcQsAM6CAgAEAgQBxAeSgQIQRgASgQIRhgAULAEWIIkYN8naAFwAngAgAGKAogB3RSSAQYwLjExLjOYAQCgAQHIAQnAAQE&sclient=gws-wiz

https://www.google.com/search?q=early+diagnosis+vs+late+diagnosis+cost&rlz=1C1GCEA_enAU811AU811&oq=early+diagnosis+vs+late+diagnosis+cost+&aqs=chrome..69i57.13379j0j7&sourceid=chrome&ie=UTF-8

For lighting

Requirements

1. flash
2. Always lighting (better)

3. Type
4. shadow
5. Similar design

6. power
7. Position
8. number

9. price

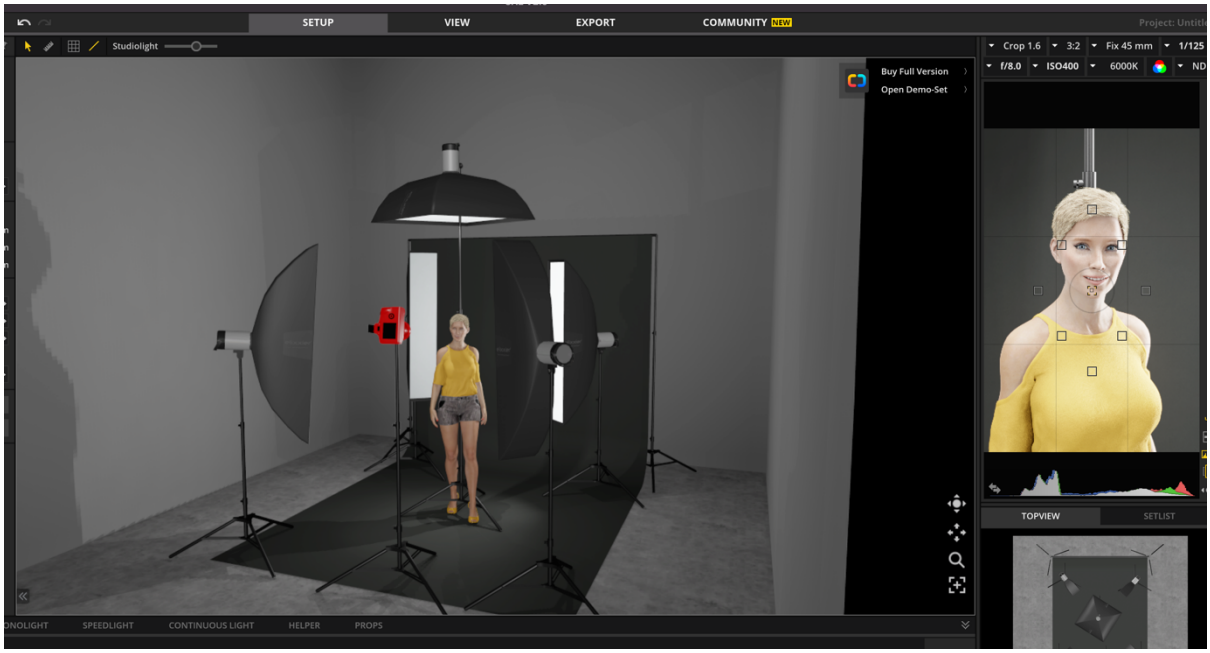
Some notes about lights

-CRI -close to 100, show the original color
-TLCI

-type: LED, 钨丝灯，镝灯X，荧光灯

Simulator software

Set.a.light.3D v2.5 studio version usd154 trail now
Initial test:



Some parameters:

Colour temperature,

Multiflash from esper

For Eye damage model

0. review

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7327317/

contains the diagnosis of conjunctiva, slit-lamp images (slit light, diffuse light, retro-illumination)

conjunctiva

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5206783/

https://ieeexplore-ieee-org.ezproxy.library.sydney.edu.au/document/6346223

https://www-sciencedirect-com.ezproxy.library.sydney.edu.au/science/article/pii/S0933365716300215

1. data collection

We have:

https://www.kaggle.com/andrewmvd/ocular-disease-recognition-odir5k

https://www.kaggle.com/jr2ngb/cataractdataset

For different disease, it's a problem.

Disease type

Need research : Need research : Pterygium, photokeratitis, photo conjunctivas

Glaucoma: ?

AMD:
Cataract:

Find more or better data

2. Multi-model

3. multi-type image (camera device)

4.

For camera control

1 Remote connectors：

Bassically it should be easy - you can join all remote connectors (wired one's , wireless should work also with less efford, but I'm not sure about delay of IR command/acquire of this command in camera and execution) every better camera have wired remote input - which often provides two separated input - AF/AE activation and shutter activation and should be most precise option in terms of "same time" definition
You should set your cameras to manual AF/AE and focus manually on subject to eliminate delay caused by different time needed to measure/focus from different angles.

Then just press shutter activation.

You should also use same cameras , as there will be great difference in shutter release delay (they can be in range of 50-200ms in modern DSLR) or at least similar range - this parameter is possible to get from manual or test websites.

2. **remote release connection**

https://www.breezesys.com/how-to-trigger-multiple-canon-cameras-at-the-same-time/

1. -**Using Multi-Camera to trigger the cameras:** This can be done by selecting "Gang camera shutter releases together" in preferences and then pressing the "Release" button in the main window. Multi-Camera instructs each camera to take a picture as quickly as possible and each camera will be triggered in turn with a delay of approximately 1/6 sec between each camera. This means if there are 18 cameras it will take approximately 3 secs from when the first camera takes a picture until the last camera takes a picture.
   When capturing video the cameras will start one after the other with a delay of approximately 1/10th sec between each camera. Better video synchronization

can be achieved using Canon EOS-1D C, Canon EOS-1D X and Canon EOS 5D Mark III cameras by triggering them using the remote release connection.

2. **Triggering the cameras using the remote release connection:** Canon EOS cameras have remote release sockets which allow the camera to be fired by simply using a switch. Multiple cameras can be fired at the same time by plugging cables into the remote release socket of each camera and wiring these together to a master switch. The cameras won't all trigger at exactly the same time due to variations in the response time of each camera but they will usually all fire within approximately 1 ms to 5 ms of each other (the variation depends on camera model, lens type etc.). **This variation can be reduced by activating the auto-focus via the remote release cables just before taking the photo.**
   This technique can also be used to start and stop video capture when using Canon EOS-1D C, Canon EOS-1D X or Canon EOS 5D Mark III cameras. To enable this the cameras need to be setup so that the shutter release button is configured to start/stop video capture (please see the camera instruction manual for details on how to set this up). The 5D Mark III must also be set to movie mode by setting the movie/camera switch to the movie position.

Products and solution

Breeze Multi-Camera Array 490/year
https://www.breezesys.com/solutions/breeze-multi-camera-event/

ESPER – TriggerBox
https://www.esperhq.com/product/multiple-camera-trigger-triggerbox/
https://www.youtube.com/watch?v=DXk93fZZxmU

notes: If we use this, it might change the type. Not all camera support Remote release connector

the ESPER product maybe expensive.

control exposure and autofocus

Difference between camera and dermatoscope

https://dermnetnz.org/topics/digital-cameras

Important parameters affecting the quality of dermatological imaging:

The following parameters affect the quality of dermatological imaging and should be considered when you are looking to buy a new device:

- Resolution — how many millions of pixels (megapixels) the camera's image sensor captures to produce the digital image

- Low-light capability — the ability to capture images and retain detail without ‘noise’ (visual distortion and fluctuations in colour and intensity of light) and loss of resolution, with ever decreasing available light
- Dynamic range — the ability to capture gradations of shades of colour, particularly at the extremes of bright and dark areas of an image (the highlights and shadows) and, as a result, fine details
- Camera lens quality — increased clarity of focus, detail and depth of field are seen with higher quality lenses
- In-camera processing — where the camera is able to manipulate captured images (eg, applying filters, noise reduction, changing colour tones and contrasts etc) to produce final images, usually in JPEG format, before they are moved off the camera onto a computer
- Colour fidelity — the accuracy with which a camera reproduces the colours of the photographed subject in the digital image; most cameras don’t have a neutral rendition of colours with standard or even so-called ‘neutral’ or ‘faithful’ colour settings (avoid cameras that reproduce skin tones too pink or red)
- Post-processing — the manipulation of images with software after they have been moved off the device onto a computer; this usually applies to images captured in RAW or variations of it (RAW is a file format that contains all data recorded by the camera sensor when an image is taken; in comparison, when shooting in a format like JPEG, image information is compressed and lost).

Other brands except Canon

Sony

For AWS

The question we need to answer

Hello,

I have received your EC2 T2 Launch Credit quota increase request, and I would be happy to submit the request for you.

For a quota increase of this type, I'll need to collaborate with our internal service team to get approval, so that we can process this request as quickly as possible, please review the following information and confirm the additional details listed below.

Please note that T2 Unlimited is now the recommended option for customers needing additional launch credits. If you need more launch credits than what is already provided by T2 Standard, you should switch to T2 Unlimited.

https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/t2-unlimited.html

This is a request to increase the number of T2 instances that can be launched with full launch credits. The default is already 100 per day. If you would like to increase the number of T2 instances you can launch to a number less than 100 per day, please see:

http://aws.amazon.com/ec2/faqs/#How_many_instances_can_I_run_in_Amazon_EC2

The default number of T2 instances that can be launched today is 20. Please review the public documentation on this quota at the link below:

http://docs.aws.amazon.com/AWSEC2/latest/UserGuide/t2-instances.html

We have recently launched the new T3 instance type. T3 instances use unlimited mode by default and do not have launch credits.

See the link below:

https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/burstable-credits-baseline-concepts.html

If you would like to follow up on your EC2 T2 Launch Credit quota increase request, please answer the questions below to the best of your knowledge:

1) What attempts have been made to switch to T2 Unlimited?

2) Why T2 Unlimited cannot be used?

3) How does the application use the launch credits?

4) How long are the T2 instances expected to live?

I appreciate your comprehension and patience on this matter.

As soon as we receive this information back from you, we can move forward with your quota increase request.

We value your feedback. Please share your experience by rating this correspondence using the AWS Support Center link at the end of this correspondence. Each correspondence can also be rated by selecting the stars in top right corner of each correspondence within the AWS Support Center.

Best regards,
Mariana A.
Amazon Web Services

For the different body size and distance change problem

1. body size(dimension)

https://www.sciencedirect.com/topics/engineering/anthropometric-data

Difficult point:

1. wide range. The difference is huge. (10cm may cause about 10% resolution loss)

Dimension list

Height

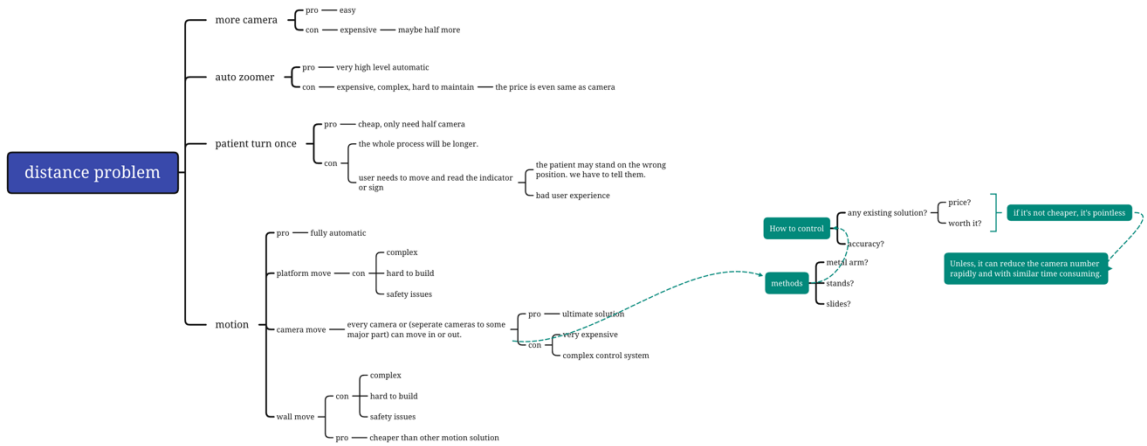
Shoulder to shoulder

2. 3D model

Body size simulator

http://humanshape.org/index.html#home

3. change



4. Camera simulator

5 bullet points

1-5

Time – (Vectra less than a second) ours: less than a second

Cost – (Vectra $550,000 + GST) ours: $120,000 to $150,000

AI model – () ours: Auxiliary diagnosis model with high accuracy(above 90%) and robustness

Privacy – (others: open space/room) ours: A comfortable photo booth with high privacy

* The different body size –

* High resolution – High quality/resolution images can be used in AI model

Proposal/milestone for Metasense

1-3

1. Cost? Is it purchasing fee only or all costs contains the salary? We didn't have the overall camera number and cost now, we can only have an estimated number.

2. resource. We see the activities and outcomes/milestones, etc, so we write in the same form, is that ok? So what kind of resources we need to address?

3. We see the timeline is long. Like 6 months for the Web and Mobile platform. We want to know the timeline is based on what level of workload or working hours.

Slider (If need)

Camera array (related knowledge)

Breeze

https://zhuanlan.zhihu.com/p/352138443
https://zhuanlan.zhihu.com/p/142252204
These mentioned "photogrammetry"
()

Power System

Cable

ESPER power box

photogrammetry

https://www.autodesk.com.au/solutions/photogrammetry-software#:~:text=Photogrammetry%20is%20the%20art%20and,2D%20or%203D%20digital%20models.

Recap

Fusion 360

Shell Design and Price

Design

Price

Potential solution and manufacturer

AI Model

PyTorch or TensorFlow

AR and VR in diagnosis

AR

https://www.mdpi.com/2673-6179/2/1/1/htm
https://escholarship.org/uc/item/6mz1s20x

VR

VR reconstruction. And no others for now.
Can strongly benefit from haptic feedback.

MR