MXB201

Text Channels / general

Georgie 19-May-22 02:06 PM

Joined the server.

Kosiol 19-May-22 05:13 PM

Joined the server.

ay lads, guess we are all working on PST2 atm hey. Let's get this assessment sorted once the pst is done

Gentner 19-May-22 05:15 PM

yeah i agree

Alexander 22-May-22 10:05 AM

Joined the server.

Georgie 01-Jun-22 11:05 AM

Hey guys, what's the planned with the project? Due date coming around fast and I know a lot of assignments are due toward the end of semester so let me know when we can organise things 🙂

Gentner 01-Jun-22 11:05 AM

Im just finishing off 2 assignments due this Friday

Alexander 01-Jun-22 11:57 AM

this is my only assignment left to do so i am open for when to start this

Georgie 01-Jun-22 12:48 PM

I also have 2 assignments due friday so im spread thin this week. But wanted to get in touch and see where everyone is at

Gentner 05-Jun-22 04:07 PM

I'm free now to start the assignment whenever you guys want, I got work tomorrow so wont be very helpfull then but free for the rest of the week

Georgie 05-Jun-22 04:58 PM

Hey I'm not free this evening sorry but i'm free tomorrow and the rest of the week. Do we want to start with making a Git Hub chat tonight/tomorrow as that is 5% of our marks?

Gentner 05-Jun-22 04:58 PM

yeah sure i can quickly make one

Alexander 05-Jun-22 04:58 PM

sounds good

Gentner 05-Jun-22 05:02 PM

what are your guys usernames on github?

Alexander 05-Jun-22 05:07 PM

Bleaty

Gentner 05-Jun-22 05:12 PM

sent you an invite (edited)

Alexander 05-Jun-22 05:26 PM

i havn't used github in a while, where would i see that invite?

Gentner 05-Jun-22 05:27 PM

https://github.com/users/Rentneg/projects/1

can you see that link?

just added a test if you can see it

or maybe check your projects on your profile

Alexander 05-Jun-22 05:28 PM

yes i can see that link

Gentner 05-Jun-22 05:28 PM

see if you can add something

Alexander 05-Jun-22 05:34 PM

i added a field to your test i think

Gentner 05-Jun-22 05:35 PM

i think we can only add files as a new item but im not sure

Alexander 05-Jun-22 05:37 PM

ah i c

Kosiol 06-Jun-22 04:10 PM

hey lads sorry i have been afk, just working on other assignments but im free to work on this one until its due

ill get started on making a github lol

oh lmao i already have one

Kosiol 07-Jun-22 10:50 AM

can you add my github to the repository?

username is JamesKosiol

also id like to start working on this today pls

Gentner 07-Jun-22 10:51 AM

Yeah same

Will add you in 15 when I get home

Kosiol 07-Jun-22 11:00 AM

sweet

Gentner 07-Jun-22 11:16 AM

alright you should be in now

do you guys wanna split into groups of 2 and work on each individual task as a pair?

theres the : MRI Diffusion Tensor Imaging

and then the feature extraction

Georgie 07-Jun-22 11:34 AM

Yeah that make sense, kinda confused with Github so sorry if Im a bit slow with getting it to work

Gentner 07-Jun-22 11:35 AM

all good

and i think i have a way better understanding of the concepts in part 2 then part 1

Georgie 07-Jun-22 11:38 AM

Sounds good, I want to have a go with the pseudocode because that makes more sense to me

Also we need to record the presentation and have a report written up before Friday. So do we want to try and make a rough timeline for when we want to try and have things finished by?

I don't know if we can do the 48hr extension just in case we need more time because I know a lot of other groups started working on this a couple of weeks ago

Gentner 07-Jun-22 11:41 AM

the coding doesn't look like it will take too long, and writing the report and presentation should only take a day

i think try and get the code done by thursday

Georgie 07-Jun-22 11:42 AM

I just finished 2 reports so I am in the rhythm of writing up reports and stuff. I'll be able to get things done pretty quick and I can start on like the intro already

If that suits you guys

Gentner 07-Jun-22 11:43 AM

yeah sure, im gonna start up on part 2 and see how much i can get done today

Alexander 07-Jun-22 11:43 AM

sounds good, i tend to be a very slow writer

Gentner 07-Jun-22 11:44 AM

im the opposite lol

Georgie 07-Jun-22 11:44 AM

Awesome, I also just have to finish off another assessment today and I'll start looking into the code. Im not confident with coding yet so please dont hate me for it

Alexander what part do you want to work on?

Alexander 07-Jun-22 11:45 AM

i am fine to work on either depending on what kosiol wants to work on

Georgie 07-Jun-22 11:45 AM

Do these messages need to be through GitHub because the assignment says if theres no correspondence on there the project wont get marked??

No wories

worries*

Gentner 07-Jun-22 11:46 AM

i think its just to show we're working together yeah

Georgie 07-Jun-22 11:46 AM

So just the coding stuff?

and sending them through to check?

Gentner 07-Jun-22 11:46 AM

most likely

Georgie 07-Jun-22 11:46 AM

awesome

Kosiol 07-Jun-22 11:52 AM

so if we are splitting up the parts ill just do whatever part you guys dont wanna do i guess haha

sounds like part 1 from what i read

Alexander 07-Jun-22 11:53 AM

sounds good

Gentner 07-Jun-22 03:13 PM

cant add mlx files to this github thing we have

Gentner 07-Jun-22 03:20 PM

i have no clue how to use github lol

wait think i got it

i started part 2 but cant figure out how to convert back to unit8 to produce the eingenface images

if anyone wants to take a look at it much appreciated

Alexander 07-Jun-22 03:30 PM

i could take a look at it if i knew where to find it, but what kind of problem are you having with converting it back to uint8?

Gentner 07-Jun-22 03:31 PM

just getting a black box but i might be doing it wrong lol

https://github.com/Rentneg?tab=repositories

> **Rentneg - Repositories**
> Rentneg has one repository available. Follow their code on GitHub.

it should be here if you can view that

gtg for an hour but ill be back later to continue

Alexander 07-Jun-22 03:45 PM

i think what might be happening is that in line 7 you are dividing the values in the image by 255 and so all of the values lie somewhere between 1 and 0, since the rest of the function relies on this transformation our i_m will also end up being between 1 and 0 which is probably why the entire image is black

Gentner 07-Jun-22 04:00 PM

oh yeah lol i need to remultiply by 255

Alexander 07-Jun-22 04:02 PM

i also don't exactly know the values that are going into the U_image just by looking at it but they should also try to span the range of 0-255

Gentner 08-Jun-22 01:37 PM

https://github.com/Rentneg/MXB201/blob/main/Part2.mlx

Still cant figure out the eigenfaces but started 3 and cleaned up parts 1 and 2

Its an issue with the SVD line but im not sure whats wrong with it lol

> **MXB201/Part2.mlx at main · Rentneg/MXB201**
> Start of part 2. Contribute to Rentneg/MXB201 development by creating an account on GitHub.

also hows part 1 coming along?

cant really start 3 and 4 coding until we figure out part 2

Alexander 08-Jun-22 01:45 PM

one thing i would suggest is adding " 'DisplayRange', [] " to the imshows, that would make the mean face we get look like the one from the background readings

which is our goal, as for the eigenfaces i have no clue what's going wrong there i assume that it has something to do with our input or the way the code handles the numbers

Gentner 08-Jun-22 01:48 PM

even without the loop, just using the first face, the eigen face is still a black box with some grey pixels randomly scattered

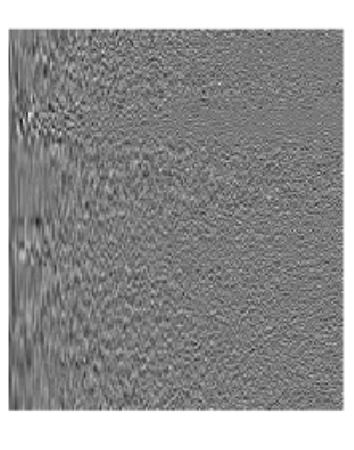
i was gonna go into stimulate tomorrow to see if anyone can help but no one does mxb201 so its probably unlikely

maybe try fiddling around with it because i have been for a couple hours now and gotten nowhere

we have to show collaborating too so sending back any changes/edits does that

Alexander 08-Jun-22 01:50 PM

when i change the imshow to be imshow(U(:, :, 1), 'initialmagnification', 'fit', 'DisplayRange', []) i get this sort of image instead



Gentner 08-Jun-22 01:51 PM

not sure what DisplayRange does but still isnt what we're looking for :/

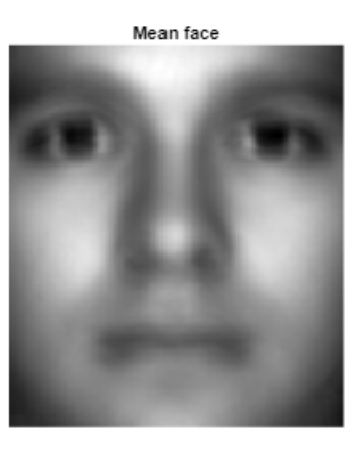
also do you think we can just send the discord chat log on our report along with the bare github to show colaboration

Alexander 08-Jun-22 01:53 PM

the Display range essentially changes the upper and lower bounds for the display range of images to be the upper and lower bounds of the matrix instead of holding them at their defaults

which for this U matrix changes everything from black and slight white dots to this static kind of image since it's working between the upper and lower bound of the matrix not 0-1 or 0-255

doing the same thing with the I_m images gives us this



which is i believe what we are looking for

Gentner 08-Jun-22 01:55 PM

yeah thats the exact same as the background reading

Alexander 08-Jun-22 01:58 PM

as for the discord thing i kinda hope so because it seems most of us are useless in terms of github

Gentner 08-Jun-22 01:59 PM

and for 4 im assuming the way to find the moustache face is just the faces that cant be accurately reconstructed in terms of the coordinate vectors

which once we figure out the eigenfaces shouldnt be super difficult

this is chapter 6 stuff which i only skimmed through very quickly so i dont have a super solid understanding of it

Alexander 08-Jun-22 02:04 PM

yeah, i assume we have to identify the co-ordinate vectors associated with image 13 of the background reading and then apply them to images and see if the images deviate from their original by a significant margin or something

Gentner 08-Jun-22 02:05 PM

thats a way better way lol but yeah something like that

Alexander 08-Jun-22 05:20 PM

i have a feeling i know what we have been doing wrong but i don't like the implications of it.

i think we are meant to convert the images into the columns of a matrix of size (192x168)X(1000) and then use that to compute the mean face (by taking the average values of the rows since each row represents a pixel of our images and so it would spit back at us a (192*168)X(1) vector which would represent our mean image if we convert it back into a 192X168 matrix) and our eigenfaces

Gentner 08-Jun-22 05:27 PM

not sure if i completely follow but definitely give it a shot

Alexander 08-Jun-22 05:28 PM

well the problem is that i would (well currently am) have to calculate the svd of a (192x168)X(1000) matrix

Gentner 08-Jun-22 05:29 PM

how long has it been running for lol

Alexander 08-Jun-22 05:30 PM

i can't exactly remember when i started it but it's at least been i'd think 15 minutes

cause i started the computation before i sent the message about it

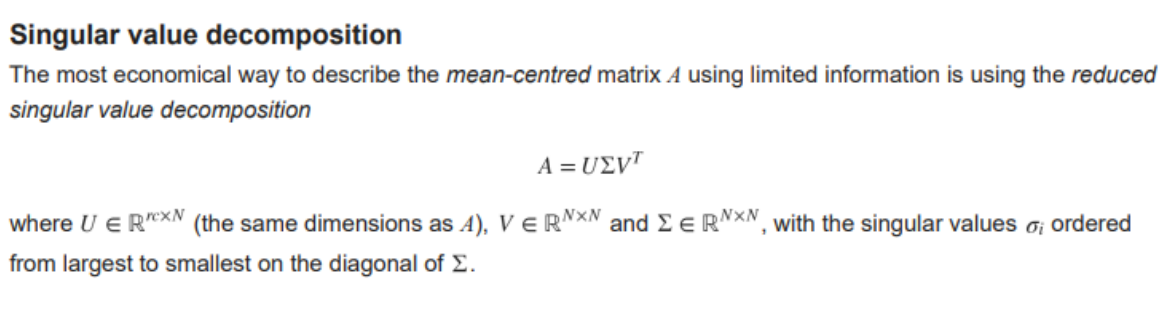
Gentner 08-Jun-22 05:30 PM

i dont think they would get us to code something that takes more than 30 seconds to run

Alexander 08-Jun-22 05:32 PM

even if they did taking 15 minutes takes far too long esp since you won't know if you did it right until you finished it

the reason i think this might be the case though is because this document seems to suggest our U matrix should be of those dimensions and our sigma and V matrixes are 1000x1000



Singular value decomposition

The most economical way to describe the *mean-centred* matrix A using limited information is using the *reduced singular value decomposition*

$$A = U\Sigma V^T$$

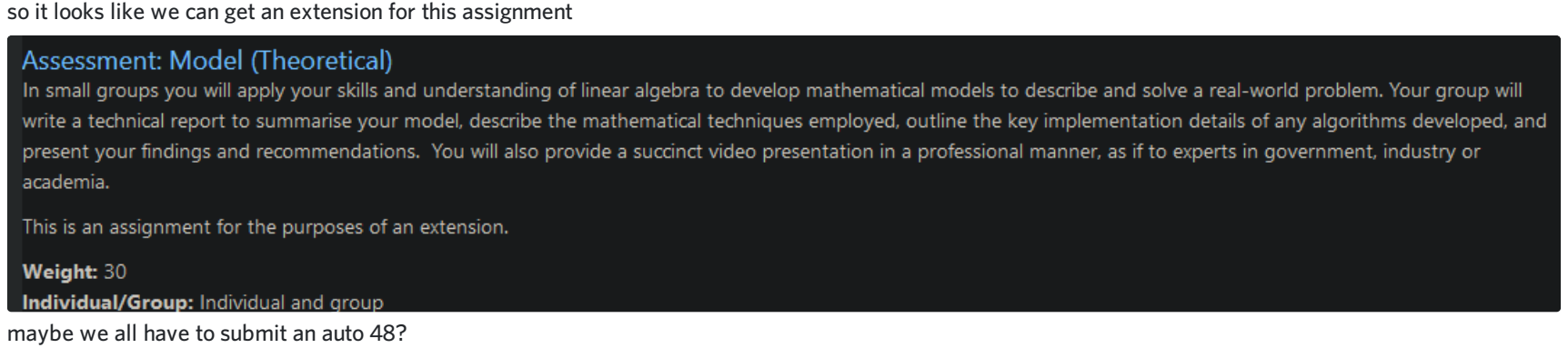
where $U \in \mathbb{R}^{n\times N}$ (the same dimensions as A), $V \in \mathbb{R}^{N\times N}$ and $\Sigma \in \mathbb{R}^{N\times N}$, with the singular values σ_i ordered from largest to smallest on the diagonal of Σ.

Kosiol 08-Jun-22 06:27 PM

@Georgie how are you going with part 1?

Kosiol 08-Jun-22 06:57 PM

so it looks like we can get an extension for this assignment



Assessment: Model (Theoretical)

In small groups you will apply your skills and understanding of linear algebra to develop mathematical models to describe and solve a real-world problem. Your group will write a technical report to summarise your model, describe the mathematical techniques employed, outline the key implementation details of any algorithms developed, and present your findings and recommendations. You will also provide a succinct video presentation in a professional manner, as if to experts in government, industry or academia.

This is an assignment for the purposes of an extension.

Weight: 30

Individual/Group: Individual and group

maybe we all have to submit an auto 48?

Alexander 08-Jun-22 06:59 PM

ok it's not exactly the cleanest code but i have managed to produce the 20 faces from the pre reading document

Gentner 08-Jun-22 07:05 PM

nice

and surely we dont need an extension

Kosiol 08-Jun-22 07:06 PM

well the option is there if we need it ig

Kosiol 08-Jun-22 09:25 PM

yo guys im struggling with part 1

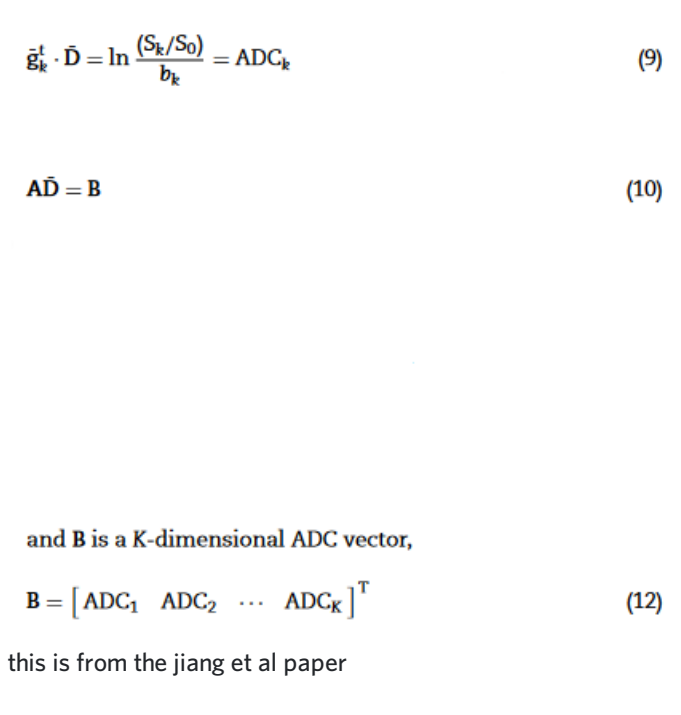
S is a 115x90x64 and is used in making the B vector, how am i going to make said B vector 64 x 1?

Gentner 08-Jun-22 09:28 PM

can you use reshape?

Kosiol 08-Jun-22 09:30 PM

nah bc in the equation it needs to be divided by another 115x90 vector



$$\vec{g}_k^{T}\cdot\vec{D} = \ln\frac{(S_k/S_0)}{b_k} = \mathrm{ADC}_k \tag{9}$$

$$A\vec{D} = B \tag{10}$$

and B is a K-dimensional ADC vector,

$$B = \left[\mathrm{ADC}_1\ \ \mathrm{ADC}_2\ \ \cdots\ \ \mathrm{ADC}_K\right]^T \tag{12}$$

this is from the jiang et al paper

Alexander 08-Jun-22 10:43 PM

i'm guessing that ln(Sk/SO) is still a matrix? (edited)

because by the looks of things they assume that this term is somehow just some singular value

Georgie 09-Jun-22 11:02 AM

Hey guys sorry for the mia, I had a family emergency yesterday. I am going through it now and will send something through in a couple of hours.

Gentner 09-Jun-22 11:05 AM

Oh sht all good

Hope everything's ok

Georgie 09-Jun-22 11:23 AM

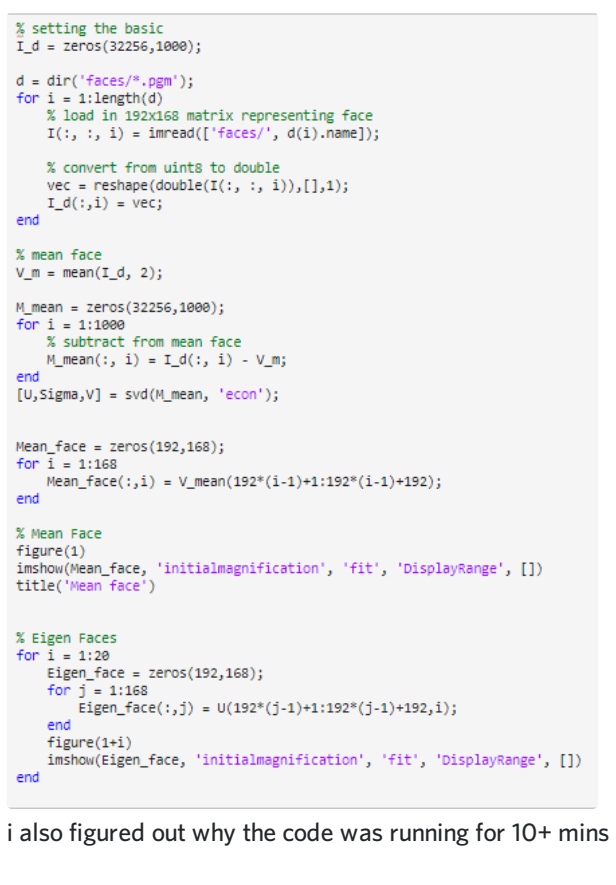
Yeah bit of a worry but getting there

Gentner 09-Jun-22 01:08 PM

how did you manage to get the eigen faces?

Alexander 09-Jun-22 01:10 PM

this is the code that got the eigenfaces



```
% setting the basic
I_d = zeros(32256,1000);

d = dir('faces/*.pgm');
for i = 1:length(d)
    % load in 192x168 matrix representing face
    I(:, :, i) = imread(['faces/', d(i).name]);

    % convert from uint8 to double
    vec = reshape(double(I(:, :, i)),[],1);
    I_d(:,i) = vec;
end

% mean face
V_m = mean(I_d, 2);

M_mean = zeros(32256,1000);
for i = 1:1000
    % subtract from mean face
    M_mean(:, i) = I_d(:, i) - V_m;
end
[U,Sigma,V] = svd(M_mean, 'econ');


Mean_face = zeros(192,168);
for i = 1:168
    Mean_face(:,i) = V_mean(192*(i-1)+1:192*(i-1)+192);
end

% Mean Face
figure(1)
imshow(Mean_face, 'initialmagnification', 'fit', 'DisplayRange', [])
title('Mean face')


% Eigen Faces
for i = 1:20
    Eigen_face = zeros(192,168);
    for j = 1:168
        Eigen_face(:,j) = U(192*(j-1)+1:192*(j-1)+192,i);
    end
    figure(1+i)
    imshow(Eigen_face, 'initialmagnification', 'fit', 'DisplayRange', [])
end
```

i also figured out why the code was running for 10+ mins and it was because M_mean matrix became a 32256 by 32256 matrix and not a 32256 by 1000 matrix

Gentner 09-Jun-22 01:15 PM

isnt V_M the mean face, do we need the for loop for Mean_Face

Alexander 09-Jun-22 01:16 PM

V_m is the mean face but it's in the form of a 1x32256 or the other way around

Gentner 09-Jun-22 01:16 PM

oh right yeah

Alexander 09-Jun-22 01:16 PM

the for loop was there to make it back into a matrix so it could be displayed

Gentner 09-Jun-22 01:17 PM

yeah that makes snes

> Alexander i'm guessing that ln(Sk/SO) is still a matrix? (edited)

Kosiol 09-Jun-22 01:37 PM

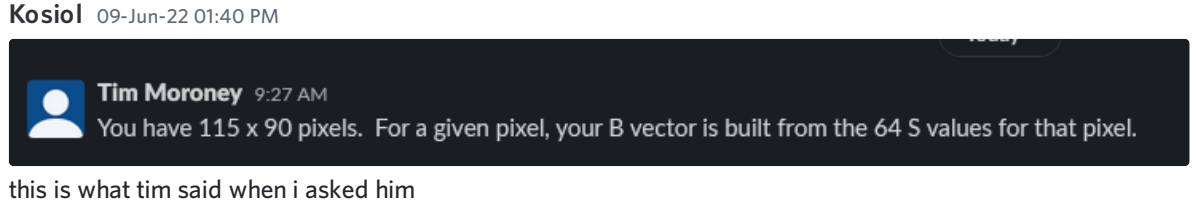
yeah still a 150x90x64 matrix

Alexander 09-Jun-22 01:39 PM

well both Sk and S0 are 115x90 matrices the 64 part is how we get the 64x1 vector as k can be anything between 1 and 64 (edited)

it's just a matter of how we can reduce that into a singular value like it seems to suggest that we can

Kosiol 09-Jun-22 01:40 PM



Tim Moroney 9:27 AM

You have 115 x 90 pixels. For a given pixel, your B vector is built from the 64 S values for that pixel.

this is what tim said when i asked him

Alexander 09-Jun-22 01:41 PM

oh that makes so much sense actually

essentially our ADK value we want will be let's say Ln(Sk(1,1)/S0(1,1))/b

and since we have S1 through to S64 we have a 64x1 vector for our given pixel (1,1)

fi that makes sense

Kosiol 09-Jun-22 01:45 PM

but theres 115x90 pixels

so if im doing it for every pixel wont matrix b be massive?

Alexander 09-Jun-22 01:46 PM

no because B will be different for every pixel

Kosiol 09-Jun-22 01:47 PM

oooh i see

Alexander 09-Jun-22 01:47 PM

your building a new B for every pixel

so you will end up with 115x90 B vectors

Kosiol 09-Jun-22 01:48 PM

yep yep makes sense

Gentner 09-Jun-22 02:24 PM

made a google doc you should be able to join and edit in

Georgie 09-Jun-22 02:25 PM

Sent a request for access

Gentner 09-Jun-22 02:25 PM

https://docs.google.com/document/d/1J-ox9HVaK4zx31EfFOuBINqHRP1WMqKaNvSuMIKt05A/edit?usp=sharing

> **MXB201**
> Queensland University of Technology MXB201 Image Analysis Group Project Advance Linear Algebra Project Group 3 Jacob Gentner N10815007, name, name, name 10th June 2022 Introduction Part 1 Part 2 Conclusion References Github ...

try this one sorry (edited)

Georgie 09-Jun-22 02:25 PM

Thank you

Gentner 09-Jun-22 02:26 PM

ill start writting up part 2

Gentner 09-Jun-22 03:42 PM

wrote up part 2 but left some spots for the code and images

definetly have a look at is alexander you seem to have a super solid understanding

Alexander 09-Jun-22 04:28 PM

will do when i find time

Kosiol 09-Jun-22 06:33 PM

just an update, georgina and i seemed to have figured out part 1 and should be finished with the code hopefully by tonight

Alexander 09-Jun-22 06:33 PM

good stuff

Alexander 09-Jun-22 06:48 PM

i looked over what you wrote for part 2 btw and added in some images of the code and the output from matlab, though they might need to be rescaled to fit better

Gentner 09-Jun-22 06:52 PM

yeah probably need to put all the eigenfaces into one figure with the number title like in the background reading

should be able to copy and paste the for loop i had in mine

Alexander 09-Jun-22 06:58 PM

not exactly but with a few modifications it works

also redid the matlab screenshot to show the change in code that i had to make

Kosiol 09-Jun-22 10:45 PM

hey guys sorry but we're gonna need help for part 1, we are just not getting it and time is running out

Alexander 09-Jun-22 10:46 PM

what are you having problems with?

Kosiol 09-Jun-22 10:46 PM

partone.mlx

84.61 KB

like following the project background and the tasks we are not able to get the 2nd and third images rendered

FA is supposed to be between 0 and 1 and we are getting 1.0419

like

bruh

Kosiol 09-Jun-22 10:55 PM

dtmri.mat

2.8 MB

Alexander 09-Jun-22 11:19 PM

did you make sure to account for the negative values of Sk?

Exported 179 message(s)