EE 569 Discussion

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Agenda

- Finish remaining content of HW5
- High level review on midterm#2
- Important:
  - Take the sample quiz on D2L!!!
  - Get familiar with how to insert image answers

HW5 - Confusion matrix

- Visualization of the classification performance
- Each row of the matrix represents the instances in an actual class while each column represents the instances in a predicted class

		Predicted condition	
	Total 8 + 4 = 12	Cancer	Non-cancer
Actual condition	Cancer	6	2
	Non-cancer	1	3

- Normalized version: each row sums to 1

HW5

- How to find top confused classes

* Google images

HW5

- How to add noise in labels on training set
  - Modify the training set before chopping it into batches
  - Take care, you should use the same set of noisy labels during multiple runs. Some methods that may not satisfy this:
    - Modify the labels inside the training loop
- How to customize the dataset
  - https://towardsdatascience.com/building-efficient-custom-datasets-in-pytorch-2563b946fd9f
- How do you know you correctly add the labeling noise
  - Show the normalized confusion matrix of the noisy training set

Midterm#2

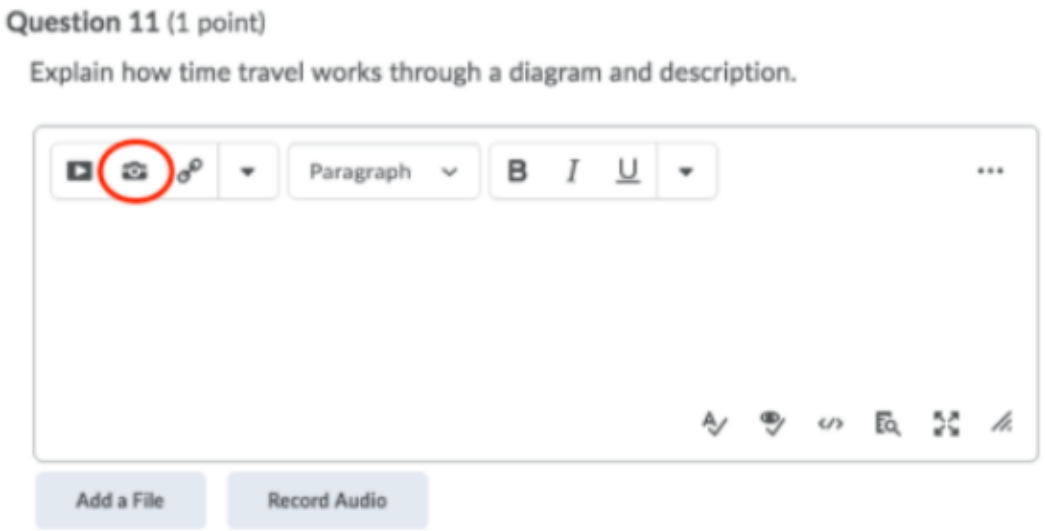
- Online exam: April 11 (Monday) 8-10am
- Same logistics as midterm#1
  - Open book, no internet, no calculators…
  - Submit on time to avoid late submission
  - The quiz only allows for one submission, so please make sure you have answered every question before clicking the "submit" button at the end

- New question types:
  - Multi-choice with justification
    - Justification doesn't need to be long but should deliver the key points.
    - No score of that justification part if you don't write anything.
  - Questions that require handwritten answers

Exam procedure for handwritten answers

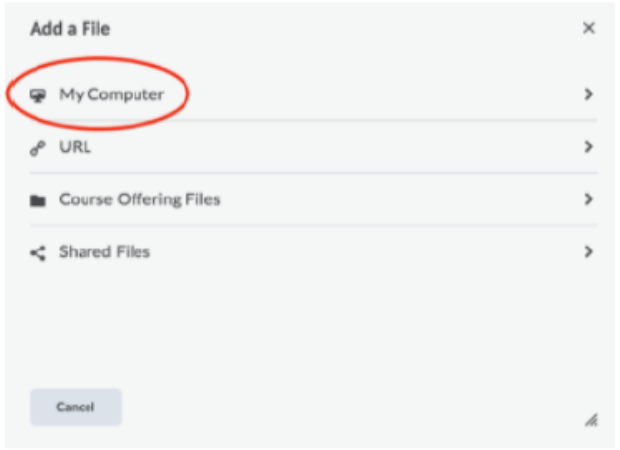
- Your quiz will include Written Response questions that require handwritten answers. You will need to take a picture of any handwritten answers and then insert them into their respective answer fields. To insert a picture into a question's answer, follow these steps:

1. Click the Camera icon in the answer field's toolbar.

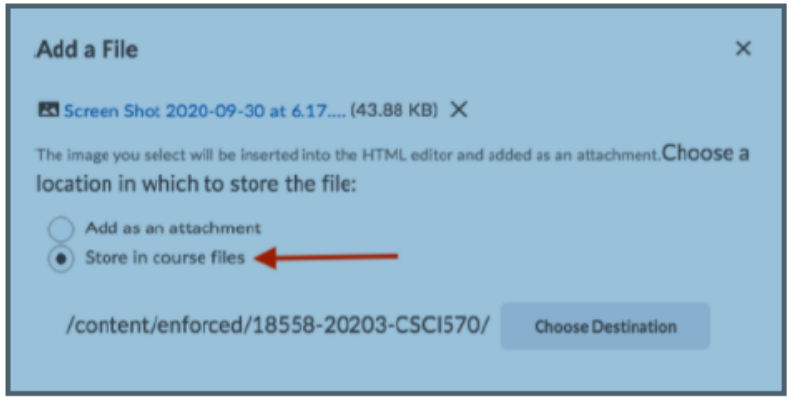


Exam procedure for handwritten answers

2. In the “Add a File” prompt, select “My Computer”.

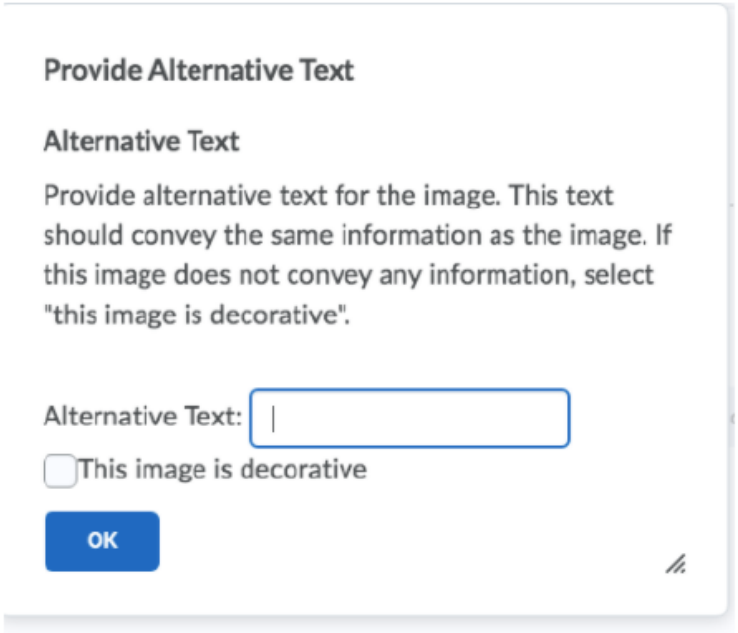


3. After adding your file, leave the “Store in course files” option selected. Click the blue “Add” button at the bottom.



Exam procedure for handwritten answers

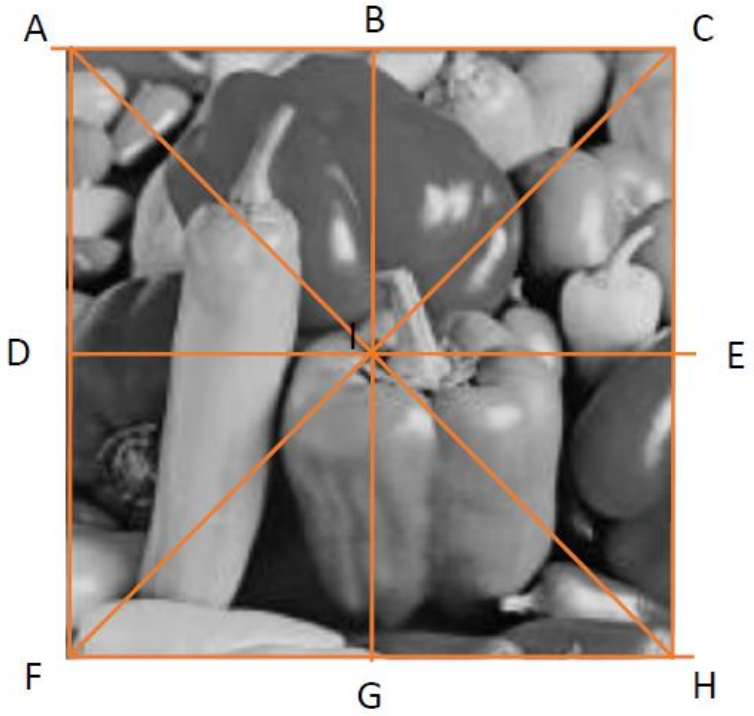
4. Type in any word inside the “Alternative Text” field.

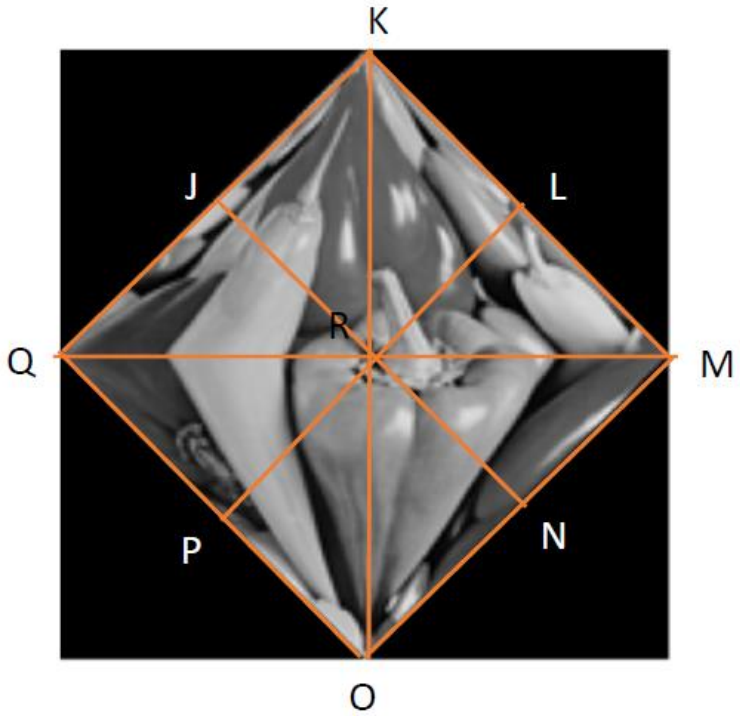


5. Your picture is now added within the answer field. If you would like to display the answer field in full screen, click the icon with four arrows pointing outwards located at the bottom right.

Review

- Geometric Modification





ABI → JKR
BCI → KLR
…

Review

- Morphological Processing
  - Shrinking:

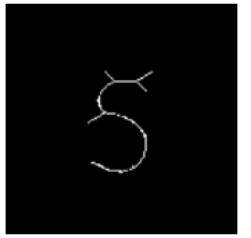
Objects without holes shrink to a point, and objects with holes shrink to a connected ring halfway between each hole and the outer boundary.

  - Thinning:

Object without holes shrinks to a minimally connected stroke, and an object with holes shrinks to a connected ring halfway between each hole and the outer boundary.

  - Skeletonizing:

removes pixels on the boundaries of objects but does not allow objects to break apart. The pixels remaining make up the image skeleton.



Review

- Morphological Processing

- Expectation on your answers
  - Doesn't have to be exactly the same as actual output from programs
  - Should capture the main idea
    - Point or ring?
    - Major branches should match

- **The only question that requires handwritten answers**

Review

- Texture Analysis
- Important content to review
  - Laws filters
  - Steps for texture classification/segmentation

Table.1 1D Kernel for 5x5 Laws Filters

Name	Kernel
L5 (Level)	[1 4 6 4 1]
E5 (Edge)	[-1 -2 0 2 1]
S5 (Spot)	[-1 0 2 0 -1]
W5 (Wave)	[-1 2 0 -2 1]
R5 (Ripple)	[1 -4 6 -4 1]

Review

- SIFT and Bag of visual words

- Important content to review
  - Properties of SIFT
  - Concepts, procedure of BoW