Thank you for participating in our reader study. This study mirrors the previous one in Nan's paper (https://arxiv.org/abs/1903.08297), **except that some of the mammograms may be perturbed.** The mammograms are presented following the convention:

1. Right breast facing left, left breast facing right
2. CC views on the top row, MLO views on the bottom row

The remainder of the instructions are identical to the previous study.

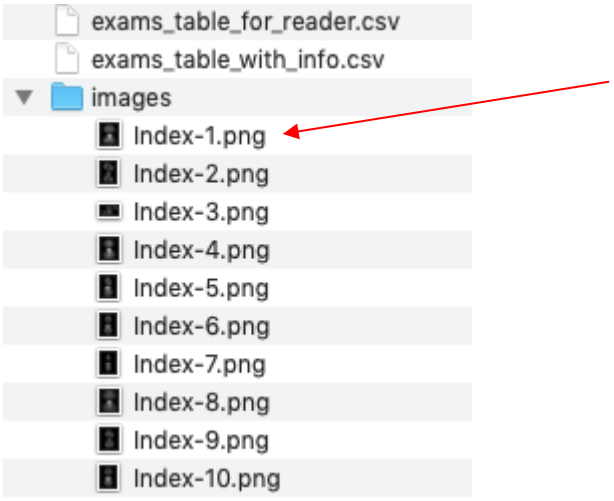
This study involves reading 20 screening mammograms without priors or history. The cases you will see are a mix of negative, benign, and malignant. Some breasts will have multiple findings. You will be interpreting the most suspicious finding in each breast.

The first set of 20 cases are for you to get familiar with the tools. You are welcome to send in any questions or suggestion after this first test set. After the finishing the this test set, please return the test datasheet to Taro (t.makino@sms.ed.ac.uk) with any comments and he will distribute the full reader set after reviewing.

Feel free to email Taro if you have any questions.

How to access images:

Inside the directory will be a reader spreadsheet and cases. The first test set will have 20 cases. Each picture in the Images folder is a full screening mammogram (Case 1 = Index-1.png, Case 2 = Index-2.png, etc).



Case 1 (full mammogram exam saved as a single picture)

How to load images:

1. Click on the appropriate case. These are full-size screening images and preferably should be viewed **on a mammo-certified monitor if you want to see calcs**. You can zoom.
2. Each breast should be assessed separately. If there are multiple findings in a breast, you will report only the most suspicious one.
3. If multiple images were taken in the original screening mammogram (repeat MLO, nipple in profile, etc) these will be also included and should be reviewed. You may find

the erroneous inclusion of diagnostic images (for example, magnification views). Please make a note of these if you find them.

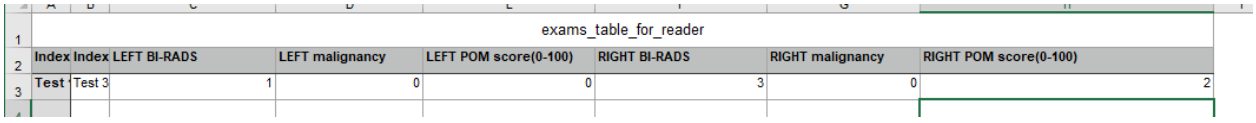
How to interpret images:

Record your responses in the provided spreadsheet. For each breast you will give:

1. BI-RADS assessment (0-5 only, please use 4A/4B/4C).
2. If you think there is malignancy in that breast (**yes=1, no=0**).
    - BI-RADS 1-3: not malignant = NO/0. BI-RADS 3 is considered not malignant in this study.
    - BI-RADS 4A-5, report malignant = YES/1.
3. For the most suspicious finding in that breast, what is your estimated chance of malignancy on a 0-100 scale, where 0=benign and 100=cancer? Remember to keep these consistent with BI-RADS: (POM, risk of malignancy)

BIRADS 1 - negative.	POM = 0%
BIRADS 2 - benign finding	POM = 0%
BIRADS 3 - probably benign finding.	0%<POM <= 2%
BIRADS category 4A lesions (low suspicion), there is 2%–10% risk of malignancy.	2%< POM <=10%
BI-RADS category 4B lesions (moderate suspicion), there is 10%–50% risk of malignancy.	10%< POM <=50%
BI-RADS category 4C lesions (high suspicion), there is 50%–95% risk of malignancy.	50%< POM <95%
BI-RADS category 5 lesions (high likelihood of malignancy, -95% risk of malignancy.	95%<= POM

This should give you a total of SIX answers, three for each breast.



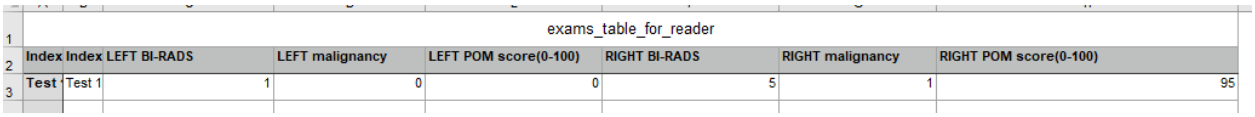
1	exams_table_for_reader						
2	Index	Index	LEFT BI-RADS	LEFT malignancy	LEFT POM score(0-100)	RIGHT BI-RADS	RIGHT malignancy	RIGHT POM score(0-100)
3	Test	Test 3	1	0	0	3	0	2

Ready to start the first official phase?

Please return the test datasheet to Taro (t.makino@sms.ed.ac.uk) with any comments and he will distribute the full reader set after reviewing.

Examples/FAQ:

1) Negative left breast, highly suspicious calcs in right breast.
    a. Left breast: BI-RADS 1. Malignant = NO (0). % chance malignancy (0-100) = 0.
    b. Right breast: BI-RADS 5. Malignant = YES (1). % chance malignancy (0-100) = 95.



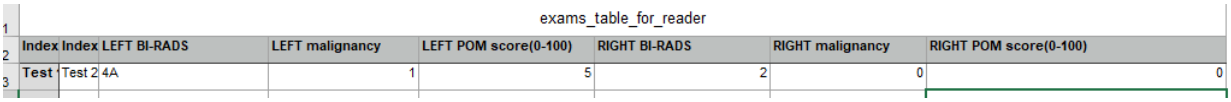
exams_table_for_reader

Index	Index	LEFT BI-RADS	LEFT malignancy	LEFT POM score(0-100)	RIGHT BI-RADS	RIGHT malignancy	RIGHT POM score(0-100)
Test	Test 1	1	0	0	5	1	95

2) Multiple benign-appearing masses both breasts, low suspicion calcs in left breast. Remember that you should report the **<u>most actionable</u>** (i.e, suspicious) finding in that breast.

   a. Left breast: BI-RADS 4A. Malignant = YES (1). % chance malignancy (0-100) = 5.

   b. Right breast: BI-RADS 2. Malignant = NO (0). % chance malignancy (0-100) = 0.



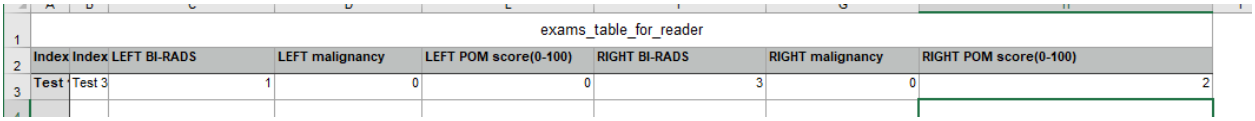
exams_table_for_reader

Index	Index	LEFT BI-RADS	LEFT malignancy	LEFT POM score(0-100)	RIGHT BI-RADS	RIGHT malignancy	RIGHT POM score(0-100)
Test	Test 2	4A	1	5	2	0	0

3) Probably benign mass right breast, negative left breast. **For this study, if you give a BI-RADS 3 you should report malignancy (yes/no, where yes =1) as NO, even if % chance malignancy is reported as >0.** If you believe it necessitates biopsy, then assign a BI-RADS of 4A or higher:

   a. Left breast: BI-RADS 1. Malignant = NO (0). % chance malignancy (0-100) = 0.

   b. Right breast: BI-RADS 3. Malignant = NO (0). % chance malignancy (0-100) = 2.



exams_table_for_reader

Index	Index	LEFT BI-RADS	LEFT malignancy	LEFT POM score(0-100)	RIGHT BI-RADS	RIGHT malignancy	RIGHT POM score(0-100)
Test	Test 3	1	0	0	3	0	2