**Bead image selection procedure – gy 20210617**

Bead images (roiImages) are now calculated for the first set, in BeadSurveyorT

They are automatically saved in the first set folder as roiImages.mat (if the autosave box is checked)

On using BeadGazer2:

After loading the desired beaddata file (from the last set folder of the experiment),

Load the roiImages file from the first set (just find it in MATLAB and double click on it)

This enables you to see a “bead pastiche” for any selected group of beads

To apply an image-based criterion, load the trainedModel (e.g. from gyBeadClassifier2.mat) and then type the following in the command window: beadImageAnalysis(roiImages,trainedModel)

This puts a classifier into the memory copy of beaddata, which can be used as a criterion: cs==1

To train a new classifier model, be sure you have the correct roiImages loaded with BeadGazer2. Then brush the “good” beads, and in the command window type: goodBeads = beadSelection;

Now brush the “bad” beads, and in the command window type: badBeads = beadSelection;

Now get the image analysis data:

bia = beadImageAnalysis(roiImages,[goodBeads;badBeads]);

and create a classifier column (true/false):

bia = [bia [repmat(true,numel(goodBeads),1) ; repmat(false,numel(badBeads),1)] ];

randomize the order of the data:

rndm = rand(size(bia,1),1);

[~,idx] = sort(rndm);

bia = bia(idx,:);

Now you need to use the Classification Learner app to create a predictive model. Briefly, create a new session and specify the training data (bia); it should automatically recognize the last column (logical) as the result. Need to explore to find best models. I set the misclassification cost for false negative (true 0, predicted 1) to 0.4, to make the classification more inclusive of true positives. Choose “All Quick-to-train” as the model type, then run the training. Plot the ROC (choosing “1” as the Positive class). Once happy, export the selected model to the workspace as trainedModel, and save it in a file (save fname trainedModel)