@Nicolas highlighted in yellow means I've pointed Nicolas to these particular ones.

BROKEN in green means tutorial is fixed so it runs, but there is some additional aspect that  
I think needs attention.

Need to think about wvfCompute and LCA, as well as rng state, as per email exchange.

We should work to make any tutorial that saves figures 1) save them into isetbioRootPath/local and 2)

print a message that tells the user where they are being saved. Here is some sample code I have

started to add for this purpose (default for saving can be either true of false, either is fine with me).  
 % Control saving of figures. We don't want tutorials

% saving things into the isetbio source tree.

saveFigures = false;

figureDir = fullfile(isetbioRootPath,'local',mfilename);

if (saveFigures)

if (~exist(figureDir,'dir'))

mkdir(figureDir);

end

fprintf('Will save figures into %s\n',figureDir)

end

Then around each call to save a figure (note conditional and full path).

if (saveFigures)

NicePlot.exportFigToPDF(fullfile(figureDir,sprintf('theMRGCMosaicActivation\_%dChecks\_%s.pdf', numberOfChecks, postFix)), hFig, 300);

end

Here are some tutorials that need this done to them:

t\_cMosaicAndOpticsGrid

t\_cMosaicEccVaryingOptics

t\_cMosaicRankedSubjectsOptics

t\_cMosaicSinewaveStimuli

t\_cMosaicSinewaveStimulus

I am not sure we want demos buried in directories like

isettools/ganglioncells/demos

why aren't the demos in there under tutorials, which is where we would be looking for them?

/Users/dhb/Documents/MATLAB/toolboxes/isetbio/tutorials/cmosaic/t\_cMosaicAndOpticsGrid.m -- BROKEN!

DHB: I made changes to computePSFandOTF that seem rational to me and make this run again.

I did a quick check and the first few PSFs it plots match those that happened under the old

ISETBio branch. But we may want to do some numerical checks on the whole thing.

There are other issues with this tutorial, though:

Even on the master, this routine prints out a lot of red warning messages:

“cone aperture is not Gaussian, so cannot visualize characteristic radius. Visualizing the diameter”.

It is not reassuring to a new user, or anyone, to have tutorials in a package print warnings. It’s

the sort of thing that would make someone stop exploring. If it’s expected behavior, there

should not be a warning. Having an option to turn it off, if we think it is useful in other situations,

would be one approach. Then it could be turned off in the tutorial with an explanation. If it is unexpected,

on the other hand, we should fix the underlying problem.

Also, this is an example of a tutorial that takes a very long time to run through a whole lot of cases.

I am not sure it is helpful to have tutorials that take so long. Indeed, I had to kill it before it

finished it was going on so long. Maybe set default parameters so

It runs nine locations for one subject, rather than a whole lot of locations for multiple subjects.

(Particularly since it overwrites each subject with the next in the figure.)

Finally, this tutorial says it saving output files, but doesn’t say where. I can’t find them. And if it were

saving them to the ISETBio tree anywhere other than local, that would be less than desirable.

/Users/dhb/Documents/MATLAB/toolboxes/isetbio/tutorials/cmosaic/t\_cMosaicEccDependentAbsorptionEfficacy.m -- BROKEN!

@Nicolas

This is broken on the ISETBio master as well, somewhere deep in cMosaic compute. Can you have a look?

/Users/dhb/Documents/MATLAB/toolboxes/isetbio/tutorials/cmosaic/t\_cMosaicEccVaryingOptics.m -- BROKEN!

/Users/dhb/Documents/MATLAB/toolboxes/isetbio/tutorials/cmosaic/t\_cMosaicRankedSubjectsOptics.m -- BROKEN!

Fixed these. But worried about where they might be saving data.

/Users/dhb/Documents/MATLAB/toolboxes/isetbio/tutorials/cmosaic/t\_cMosaicModifyApertureProperties.m -- BROKEN!

@Nicolas

This had a typo which I fixed and now it runs. But something it calls prints out a warning  
 \*\* structs 's1' and 's2' have different number of fields: 4 vs 3

which reduces confidence that it is right.

/Users/dhb/Documents/MATLAB/toolboxes/isetbio/tutorials/cmosaic/t\_cMosaicRodIntrusion.m -- BROKEN!

@Nicolas

Fails because it can't find data file

Unable to find file or directory '/Users/dhb/Documents/MATLAB/toolboxes/isetcam/CurcioConesRods.mat'.

/Users/dhb/Documents/MATLAB/toolboxes/isetbio/tutorials/cmosaic/t\_cMosaicSpatioTemporalStimulation.m -- BROKEN!

@Nicolas

This was initially broken because it relied on the sceGrating method in ISETBioCSFGenerator. Probably it

could ever run because it was developed at a moment when the CSFGenerator was on the path.

I moved it over to ISETBioCSFGenerator. Now it is broken there, for some other reason having to do with inteporating wavelengths.

/Users/dhb/Documents/MATLAB/toolboxes/isetbio/tutorials/cmosaicrect/t\_cmosaicRectBigArray.m -- BROKEN!

@Brian

I fixed this so it runs by updating 'show' -> 'plottype' in the call to the window method of coneMosaicRect. But,

if you run it to the end it produces a strange plot that looks like this:

A screenshot of a computer

Description automatically generated

/Users/dhb/Documents/MATLAB/toolboxes/isetbio/tutorials/cones/t\_conesEyeSensitivity.m -- BROKEN!

@Nicolas

This is a tree shrew related tutorial. It was calling a function coneMosaicTreeShreeCreate, which fails because

we no longer have a cone mosaic. I switched to cMosaicTreeShrewCreate, but that fails because it also calls

coneMosaicHex. It looks like this is to get cone positions. We need to remove this dependence.

/Users/dhb/Documents/MATLAB/toolboxes/isetbio/tutorials/cones/t\_conesMapRF.m -- BROKEN!

@Nicolas

This depends on something called the RetinaToVisualFieldTransformer object, but that does not exist.

/Users/dhb/Documents/MATLAB/toolboxes/isetbio/tutorials/data/underDevelopment/t\_rgcEccData.m -- BROKEN!

/Users/dhb/Documents/MATLAB/toolboxes/isetbio/tutorials/eyemovement/t\_fixationalEyeMovementsAndConeMosaicVideo.m -- BROKEN!

This one is broken because it loads a precomputed coneMosaicHex. Need to convert to cMosaic.

/Users/dhb/Documents/MATLAB/toolboxes/isetbio/tutorials/eyemovement/underDevelopmentReplaceConeMosaicHex/t\_fixationalEMConeSampling.m -- BROKEN!

/Users/dhb/Documents/MATLAB/toolboxes/isetbio/tutorials/eyemovement/underDevelopmentReplaceConeMosaicHex/t\_fixationalEMTimeSampling.m -- BROKEN!

/Users/dhb/Documents/MATLAB/toolboxes/isetbio/tutorials/eyemovement/underDevelopmentReplaceConeMosaicHex/t\_fixationalEyeMovementsToIsomerizations.m -- BROKEN!

@Nicolas: These die in oisCreate with fairly simple usage. Not sure what the issue is. Maybe you can fix it? I think this same fix will also fix

one of the remaining broken examples.

Once that problem is addressed, we also need to convert to cMosaic.

/Users/dhb/Documents/MATLAB/toolboxes/isetbio/tutorials/hyperspectral/underDevelopmentReplaceConeMosaicHex/t\_hyperspectralSceneTutorial.m -- BROKEN!

Dies because it is trying to read data from the archiva server. Needs to be fixed up to read data from somewhere else.

Will also need to replace coneMosaicHex.

/Users/dhb/Documents/MATLAB/toolboxes/isetbio/tutorials/mrgc/t\_mRGCMosaicCheckerBoardStimulus.m -- BROKEN!

I fixed this. But it says it is saving figures somewhere. I don't know where. OK to save to local, but if it's going to save

figures, it should say where they are so the user can find them.

/Users/dhb/Documents/MATLAB/toolboxes/isetbio/tutorials/mrgc/t\_mRGCMosaicDynamicStimulus.m -- BROKEN!

@Nicolas

Dies in a call to displayCreate inside of rfMappingStimulusGenerator.presentationDisplay. Needs some TLC.

/Users/dhb/Documents/MATLAB/toolboxes/isetbio/tutorials/mrgc/supportTutorials\_mRGCmosaic/t\_mRGClatticePrecompute.m -- BROKEN!

@Nicolas

This dies in some basic way. See below. I can't even find it in the ISETBio master, however so maybe it has gone away entirely? That

would be a little mysterious, though, because I have merged all changes from the master into the isetcam-merge branch?

>> t\_mRGClatticePrecompute

Error using mRGCMosaic

'computeMeshFromScratch' is not a recognized parameter. For a list of valid name-value pair arguments, see the documentation for this function.

Error in t\_mRGClatticePrecompute (line 17)

mRGCMosaic(...

/Users/dhb/Documents/MATLAB/toolboxes/isetbio/tutorials/oisequences/t\_oisCreate.m -- BROKEN!

@Brian, this looks like it's in your baliwick.

This was dying because we didn't have sceneVernier in the ISETCam branch. I moved

that and some other scene utilities in. Now it is dying on the actual call to sceneVernier.

There is some tangling of the way the arguments are being passed from oisCreate to

sceneCreate circa line 200, but I can't follow the logic easily.

Operator ':' is not supported for operands of type 'struct'.

Error in sceneCreate>sceneVernier (line 1176)

topCols = (1:width) + round((c - width)/2) - floor(offset/2);

Error in sceneCreate (line 493)

scene = sceneVernier(scene,sz,width,offset,lineReflectance,backReflectance);

Error in oisCreate (line 201)

s cene{ii} = sceneCreate('vernier', 'display', tparams(ii));

Error in t\_oisCreate (line 139)

[vernier, scenes] = oisCreate('vernier', 'add', stimWeights, ...

/Users/dhb/Documents/MATLAB/toolboxes/isetbio/tutorials/optics/t\_wvfWatsonJOV.m -- BROKEN!

Got this to work again. There is a comment from before that Brian and I should try

to figure out why the figures we produce don't match up with Watson's. Maybe

a microns/diopters issue in specification of zcoeffs? Just a guess.

/Users/dhb/Documents/MATLAB/toolboxes/isetbio/tutorials/recipes/t\_computingWithCustomPSFs.m -- BROKEN!

This is broken because a call to opticsGet(optics,'psf support', ...) appears has quite a different calling convention now than

it once did. Not sure why, nor is it immediately clear how to get the new needed args to pass.

This was also broken for a different reason in the ISETBio branch, so once the opticsGet problem is fixed

there may be additional issues.

/Users/dhb/Documents/MATLAB/toolboxes/isetbio/tutorials/outersegment/underDevelopment\_os/t\_osCurrentsVsLuminanceLevel.m -- BROKEN!

Fixed so it runs again. It was underDevelopment, I think, because it is sufficiently undercommented as not to be useful as a tutorial.

Which is to say, the only comments are ones DHB added some time ago, kvetching about the lack of comments.

It does produce some nice looking figures, so could be quite useful if we knew what it was about.

/Users/dhb/Documents/MATLAB/toolboxes/isetbio/tutorials/recipes/t\_dynamicStimulusToPhotocurrent.m -- BROKEN!

This throws the following error. This runs further on the ISETBio branch, but throws an out of memory

on the java heap error. That's not good, on a machine with 64GB memory. Scale it down.

t\_dynamicStimulusToPhotocurrent

Setting up cone mosaic.

Creating zero contrast background scene.

Mean scene luminance: 94.76 cd/m2

Computing retinal image for background scene.

Warning: Returning lens to sensor distance.

> In oiGet (line 304)

In t\_dynamicStimulusToPhotocurrent>opticalImageConstruct (line 1181)

In t\_dynamicStimulusToPhotocurrent (line 163)

Error using t\_dynamicStimulusToPhotocurrent>opticalImageConstruct

Failed to set pupil diameter as expected

Error in t\_dynamicStimulusToPhotocurrent (line 163)

BaseOI = opticalImageConstruct(oiParams);

/Users/dhb/Documents/MATLAB/toolboxes/isetbio/tutorials/wavefront/underDevelopment/t\_wvfComputeAverageObserverConePSF.m -- BROKEN!

This is under development and throws an error that says so. It should not be autorun. We should update it, though.

Let's not use red text to print out expected things. An example is t\_roiBasic.m. Red text screams out, "I am broken". More generally,

we should try to avoid have tutorials throw warnings. Other ones to look at in this regard:

t\_mRGCMosaicVisualize.m

t\_mRGCMosaicBasic.m

t\_fixationalEyeMovementsAndConeMosaicVideo.m

t\_conesEyeSensitivity.m

t\_cMosaicRankedSubjectsOptics.m

t\_cMosaicModifyApertureProperties

t\_cMosaicAndOpticsGrid

/Users/dhb/Documents/MATLAB/toolboxes/isetbio/tutorials/recipes/t\_generateConeSpecificStimuli.m -- BROKEN!

Might be as simple as a transpose somewhere, but something has changed in some basic convention

that we ought to understand.

Error using imageLinearTransform

image/T data sizes are incorrect. If im is RGB, size(T,1) must be 3.

Error in t\_generateConeSpecificStimuli (line 50)

background.RGB = imageLinearTransform(background.XYZ, inv(displayGet(presentationDisplay, 'rgb2xyz')));