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In[ ]:= (**Input identifying information**)

In[ ]:= date = ToString[Evaluate[Input["Input the date of the experiment"]]]

In[ ]:= mouse = ToString[Evaluate[Input["Input the mouse identity (e.g. Mouse123)"]]]

In[ ]:= sessionNumBef = Evaluate[Input["Input the session number before manipulation"]]

In[ ]:= sessionNumAft = Evaluate[Input["Input the session number after manipulation"]]

In[ ]:= discROIsQ = ToString[Evaluate[Input["Are there any non-useable ROIs?"]]]

In[ ]:= numROIs =
    Length[FileNames["*", File[StringJoin["S:/Imaging/Garrett/FMB208_2PRig/", date, "/",
        mouse, "/Session", ToString[sessionNumBef], "/dFOverF0TimeSeries/"]]]];

In[ ]:= If[discROIsQ == "Yes",
    nonUserROIs = ToExpression[Import[StringJoin["S:/Imaging/Garrett/FMB208_2PRig/",
        date, "/", mouse, "/Session", ToString[sessionNumAft], "/", date, "_", mouse,
        "_Session", ToString[sessionNumAft], "_nonUseableROIs.txt"]]]; nonUserROIs = {}];

In[ ]:= sigROIsBef = Import[StringJoin["S:/Imaging/Garrett/FMB208_2PRig/", date, "/", mouse,
    "/Session", ToString[sessionNumBef], "/VisStimResults/", date, "_", mouse,
    "_Session", ToString[sessionNumBef], "_sigResponsiveROIs.txt"], "List"];

In[ ]:= sigROIsAft = Import[StringJoin["S:/Imaging/Garrett/FMB208_2PRig/", date, "/", mouse,
    "/Session", ToString[sessionNumAft], "/VisStimResults/", date, "_", mouse,
    "_Session", ToString[sessionNumAft], "_sigResponsiveROIs.txt"], "List"];

In[ ]:= sigRespROIs = DeleteCases[Table[
    If[MemberQ[sigROIsBef, n] || MemberQ[sigROIsAft, n], n, Null], {n, 1, numROIs}], Null];
(**An ROI is significantly responsive it was significantly responsive
during the before session OR the after session**)

In[ ]:= nonSigRespROIs = Complement[Range[numROIs], sigRespROIs]

In[ ]:= noGoodROIs = DeleteDuplicates[Join[nonSigRespROIs, nonUserROIs]]

In[ ]:= usefulROIs = Complement[Range[numROIs], noGoodROIs]

In[ ]:= (**For each ROI that can be used for paired analysis,
upload the contrast response data for the 2 sessions**)

In[ ]:= Table[Evaluate@ToExpression[StringJoin["crfBef", ToString[n]]] =
    ToExpression /@ Import[StringJoin["S:/Imaging/Garrett/FMB208_2PRig/", date,
        "/", mouse, "/Session", ToString[sessionNumBef], "/VisStimResults/",
        date, "_", mouse, "_Session", ToString[sessionNumBef], "_",
        "crf_ROI", ToString[n], ".txt"], "List"]; {n, usefulROIs}];

In[ ]:= Table[Evaluate@ToExpression[StringJoin["crfAft", ToString[n]]] =
    ToExpression /@ Import[StringJoin["S:/Imaging/Garrett/FMB208_2PRig/", date,
        "/", mouse, "/Session", ToString[sessionNumAft], "/VisStimResults/",
        date, "_", mouse, "_Session", ToString[sessionNumAft], "_",
        "crf_ROI", ToString[n], ".txt"], "List"]; {n, usefulROIs}];

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In[ ]:= (**For each ROI that can be used for paired analysis,
construct contrast response data that are
normalized to the maximum response across the 2 sessions**)

In[ ]:= Table[Evaluate@ToExpression[StringJoin["maxResp", ToString[n]]] =
Max[Join[(ToExpression[StringJoin["crfBef", ToString[n]]][[All, 2]],
ToExpression[StringJoin["crfAft", ToString[n]]][[All, 2]]];, {n, usefulROIs}];

In[ ]:= Table[Evaluate@ToExpression[StringJoin["crfBefNorm", ToString[n]]] =
Partition[Riffle[(ToExpression[StringJoin["crfBef", ToString[n]]][[All, 1]],
(ToExpression[StringJoin["crfBef", ToString[n]]][[All, 2]] /
(ToExpression[StringJoin["maxResp", ToString[n]]][[All, 2]]), 2];, {n, usefulROIs}];

In[ ]:= Table[Evaluate@ToExpression[StringJoin["crfAftNorm", ToString[n]]] =
Partition[Riffle[(ToExpression[StringJoin["crfAft", ToString[n]]][[All, 1]],
(ToExpression[StringJoin["crfAft", ToString[n]]][[All, 2]] /
(ToExpression[StringJoin["maxResp", ToString[n]]][[All, 2]]), 2];, {n, usefulROIs}];

In[ ]:= (**Visualize normalized contrast-response data for each ROI for the 2 sessions**)

In[ ]:= Manipulate[ListLinePlot[{ToExpression[StringJoin["crfBefNorm", ToString[n]]],
ToExpression[StringJoin["crfAftNorm", ToString[n]]}],
PlotStyle -> {Black, Green}, PlotRange -> All], {n, usefulROIs}]

In[ ]:= (*****)

In[ ]:= Export[StringJoin["S:/Imaging/Garrett/FMB208_2PRig/", date, "/", mouse,
"/PairedAnalysis/", date, "_", mouse, "_pairedROIs.txt"], usefulROIs];

In[ ]:= Table[Export[StringJoin["S:/Imaging/Garrett/FMB208_2PRig/", date, "/", mouse,
"/PairedAnalysis/", date, "_", mouse, "_normCRFbefore_ROI", ToString[n], ".txt"],
ToExpression[StringJoin["crfBefNorm", ToString[n]]]], {n, usefulROIs}];

In[ ]:= Table[Export[StringJoin["S:/Imaging/Garrett/FMB208_2PRig/", date, "/", mouse,
"/PairedAnalysis/", date, "_", mouse, "_normCRFafter_ROI", ToString[n], ".txt"],
ToExpression[StringJoin["crfAftNorm", ToString[n]]]], {n, usefulROIs}];

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