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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], "/Pupil/", date, "_",
  mouse, "_Session", ToString[sessionNumBef], "_pupilModROIs.txt"], "List"];

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

In[ ]:= sigRespROIs = DeleteCases[Table[
  If[MemberQ[sigROIsBef, n] && MemberQ[sigROIsAft, n], n, Null], {n, 1, numROIs}], Null];
(**ROIs are only acceptable if they were acceptable both before and after**)

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 locomotion modulation index for the 2 sessions,
  and pair the indices for the sessions**)

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

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

In[ ]:= catenatedPupilCrossCorrsBef =
  Table[ToExpression[StringJoin["dffPupCCBef", ToString[n]]], {n, usefulROIs}];

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In[ ]:= peakCrossCorrsBef = Table[Max[(catenatedPupilCrossCorrsBef[[n]])][[All, 2]]],
      {n, 1, Length[catenatedPupilCrossCorrsBef]};

In[ ]:= catenatedPupilCrossCorrsAft =
      Table[ToExpression[StringJoin["dffPupCCAft", ToString[n]]], {n, usefulROIs}];

In[ ]:= peakCrossCorrsAft = Table[Max[(catenatedPupilCrossCorrsAft[[n]])][[All, 2]]],
      {n, 1, Length[catenatedPupilCrossCorrsAft]};

In[ ]:= Table[Evaluate@ToExpression[StringJoin["pupModPaired", ToString[usefulROIs[[n]]]]] =
      {usefulROIs[[n]], Flatten@{peakCrossCorrsBef[[n]], peakCrossCorrsAft[[n]]}};
      {n, 1, Length[usefulROIs]};

      (**Visualize dFF-pupil correlation data for each ROI for the 2 sessions**)

In[ ]:= Manipulate[
      {ListLinePlot[{ToExpression[StringJoin["dffPupCCBef", ToString[n]]], ToExpression[
        StringJoin["dffPupCCAft", ToString[n]]}], PlotStyle -> {Black, Red}, PlotRange -> All],
      ToExpression[StringJoin["pupModPaired", ToString[n]]], {n, usefulROIs}

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

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

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

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