Eye Diagram Generator for Optical Communications

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The following code, generates an eye diagram from a simple signal.
The variable InSignal is a 1-d array and represents the signal sampled uniformly in time over many bit periods.
The input variable NumPoints is a positive integer and represents the number of sampled points in each bit period.
The input variable Shift is a positive integer. Setting Shift to larger than zero removes the 1st "Shift" elements of InSignal and thus simply shifts the opening of the eye more towards the center.

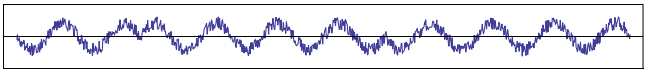
In[1]:=
```
EyeDiagram[InSignal_, NumPoints_, Shift_] := Module[{outPlot},
    parSignal = Partition[Drop[InSignal, Shift], NumPoints];
    dimparSignal = Dimensions[parSignal][[1]];
    plotoutj = Table[0, {j, 1, dimparSignal}];
    plotoutj =
     Table[ListPlot[parSignal[[j]], Joined → True, PlotRange → All, FrameTicks → {{}, {}, {}, {}},
       Frame → True, DisplayFunction :→ Identity], {j, 1, dimparSignal}];
    outPlot = Show[plotoutj];
    outPlot];
```

In the following example, we generate an arbitrary "inputSignal" with j=10 bit periods where each bit period is sampled at 100 points.
The 1st plot shows "inputSignal".
In the 2nd plot, the eye diagram is shown where the signal is over-plotted after each 100 sampled points or equivalently after each bit period.
In the 3rd plot, the eye diagram is shifted to the center by removing the 1st 25 points of "inputSignal".

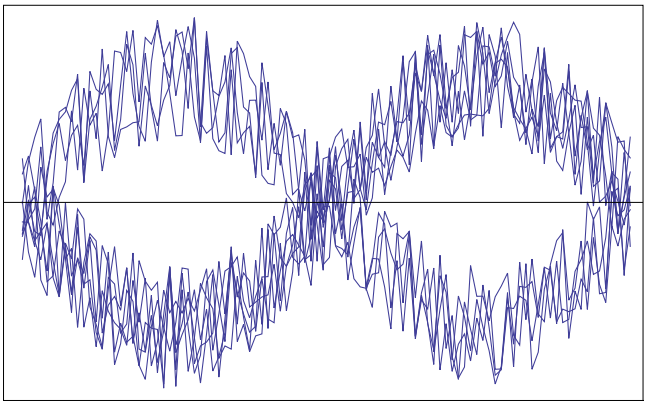
In[75]:=
```
inputSignal = {};
Do[inputSignal = Join[inputSignal, (2 Random[Integer, {0, 1}] - 1) *
    Table[Sin[2 π (i - 1.)/100] + Random[Real, {-0.5, 0.5}], {i, 1, 100}]];, {j, 1, 10}]

ListPlot[inputSignal, Joined → True, PlotRange → All, FrameTicks → {{}, {}, {}, {}},
 AspectRatio → 0.1, Frame → True, DisplayFunction :→ Identity]
EyeDiagram[inputSignal, 100, 0]
EyeDiagram[inputSignal, 100, 25]
```

Out[77]=



Out[78]=



Out[79]=