In[63]:= `img1 = Import["/Users/rhariadi/Downloads/NonPurified_6hx001.xlsx"];`
`(*img2=Import["/Users/rhariadi/Downloads/Purified_6hx001.xlsx"];*)`

In[64]:= `data1 = Flatten[img1[[1]]];`
`(*data2=Flatten[img2[[1]]];*)`

In[65]:= `(*ListDensityPlot[img1[[1]]];*)`

In[66]:= `sortedData1 = Sort[data1];`
`(*sortedData2=Sort[data2];*)`

In[67]:= `n = Length[sortedData1]`

Out[67]= 262 144

In[68]:= $cdfData1 = Table\left[\left\{sortedData1[[i]] \, 10^9, \frac{i}{n}\right\}, \{i, n\}\right];$

$(*cdfData2=Table\left[\left\{sortedData2[[i]] \, 10^9, \frac{i}{n}\right\}, \{i,n\}\right];*)$

In[69]:= `nlm = NonlinearModelFit[cdfData1,`
`    {a CDF[NormalDistribution[`$\mu1$`, `$\sigma1$`], x] + (1 - a) CDF[NormalDistribution[`$\mu2$`, `$\sigma2$`], x],`
`     10 > `$\mu2$` > `$\mu1$` > -5, 0 < a < 1}, {{a, 0.5}, {`$\mu1$`, -1}, {`$\sigma1$`, 2}, {`$\mu2$`, 1}, {`$\sigma2$`, 3}}, x]`

Out[69]= `FittedModel[` 0.185334 Erfc[4.40401×(-0.758575 - x)] + 0.314666 Erfc[1.33745×(0.399374 - x)] `]`

In[70]:= `nlm["BestFitParameters"]`

Out[70]= {a → 0.370668, $\mu1$ → -0.758575, $\sigma1$ → 0.16056, $\mu2$ → 0.399374, $\sigma2$ → 0.528696}

In[71]:= `aFit = nlm["BestFitParameters"][[1, 2]];`
`    `$\mu1$`Fit = nlm["BestFitParameters"][[2, 2]];`
`    `$\sigma1$`Fit = nlm["BestFitParameters"][[3, 2]];`
`    `$\mu2$`Fit = nlm["BestFitParameters"][[4, 2]];`
`    `$\sigma2$`Fit = nlm["BestFitParameters"][[5, 2]];`

In[76]:= `Show[ListLinePlot[cdfData1], Plot[aFit CDF[NormalDistribution[`$\mu1$`Fit, `$\sigma1$`Fit], x] +`
`    (1 - aFit) CDF[NormalDistribution[`$\mu2$`Fit, `$\sigma2$`Fit], x], {x, -10, 10}, PlotStyle → Red]]`

Out[76]=
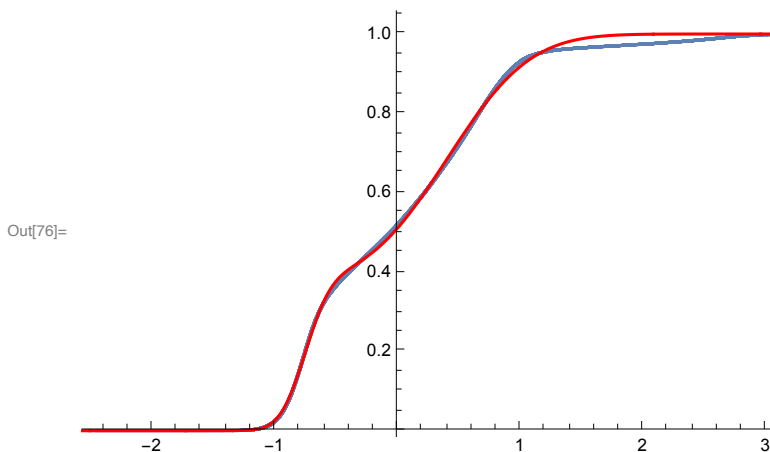
```
In[77]:= nlm = NonlinearModelFit[cdfData1,
         {a CDF[NormalDistribution[μ1, σ1], x] + (b) CDF[NormalDistribution[μ2, σ2], x] +
            (c) CDF[NormalDistribution[μ3, σ3], x], 10 > μ3 > μ2 > μ1 > −1,
          0 < μ3 < 4,
          a + b + c == 1,
          0 < a < Min[{1.2 aFit, 1}],
          0 < b < Min[{1.2×(1 − aFit), 1}],
          0.005 < c < 0.1,
          1.2 σ1Fit > σ1 > 0.8 σ1Fit,
          1.2 σ2Fit > σ2 > 0.8 σ2Fit,
          2 > σ3 > 0,
          0.8 μ2Fit < μ2 < 1.2 μ2Fit,
          0.8 μ1Fit > μ1 > 1.2 μ1Fit},
         {{a, aFit}, {μ1, μ1Fit}, {σ1, σ1Fit},
          {b, 1 − aFit}, {μ2, μ2Fit}, {σ2, σ2Fit}, {μ3, 2}, {σ3, σ1Fit}, c}, x]
```

Out[77]= FittedModel[0.188077 Erfc[4.34424×(−0.756952 − x)] + ≪19≫ ≪1≫ + 0.00437168 Erfc[6.33799×(2.84343 − x)]]

```
In[78]:= Min[{1, 2}]
```

Out[78]= 1

```
In[79]:= nlm["BestFitParameters"]
```

Out[79]= {a → 0.376154, μ1 → −0.756952, σ1 → 0.162769, b → 0.615102,
         μ2 → 0.395529, σ2 → 0.512496, μ3 → 2.84343, σ3 → 0.111566, c → 0.00874336}

```
In[80]:= aFit = nlm["BestFitParameters"][[1, 2]];
         μ1Fit = nlm["BestFitParameters"][[2, 2]];
         σ1Fit = nlm["BestFitParameters"][[3, 2]];
         bFit = nlm["BestFitParameters"][[4, 2]];
         μ2Fit = nlm["BestFitParameters"][[5, 2]];
         σ2Fit = nlm["BestFitParameters"][[6, 2]];
         μ3Fit = nlm["BestFitParameters"][[7, 2]];
         σ3Fit = nlm["BestFitParameters"][[8, 2]];
         cFit = nlm["BestFitParameters"][[9, 2]];
```

In[89]:= `Show[ListLinePlot[cdfData1], Plot[aFit CDF[NormalDistribution[`μ`1Fit, `σ`1Fit], x] +`
`(bFit) CDF[NormalDistribution[`μ`2Fit, `σ`2Fit], x] +`
`(cFit) CDF[NormalDistribution[`μ`3Fit, `σ`3Fit], x], {x, −10, 10}, PlotStyle → Red]]`

Out[89]=
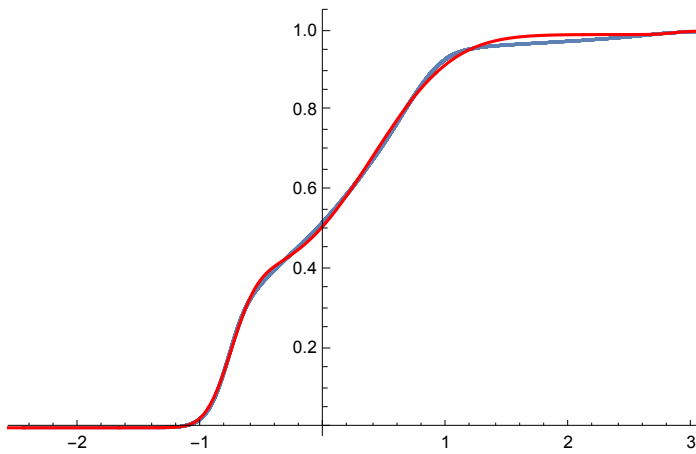
In[90]:= `Show[Histogram[sortedData1 10`^{9}`],`
`Plot[40 000 aFit PDF[NormalDistribution[`μ`1Fit, `σ`1Fit], x] +`
`40 000 (bFit) PDF[NormalDistribution[`μ`2Fit, `σ`2Fit], x] +`
`40 000 (cFit) PDF[NormalDistribution[`μ`3Fit, `σ`3Fit], x],`
`{x, −10, 10}, PlotStyle → Red, PlotRange -> All]]`

⋯ General: 15046.2 $1.660130587728 \times 10^{-700}$ is too small to represent as a normalized machine number; precision may be lost.

⋯ General: 349.734 $1.016434372514 \times 10^{-2877}$ is too small to represent as a normalized machine number; precision may be lost.

Out[90]=