**Homogeneous Poisson Spike Generator**

To generate a spike train, we can use the interspike interval distribution to sample intervals between each spike, starting from zero over some period T.

from the interspike interval distribution of 

We can remove delta t to achieve the probability density distribution: **re-rt**  *delta t -> 0*

Chart, line chart

Description automatically generated

By integrating the probability density function, we attain the cumulative distribution function, which we ensure approaches 1 by manipulating the ‘c’ value.

Integral(pdd) = c - ert

CDF = 1 – e-rt

A picture containing shoji, tiled

Description automatically generated

Finally to sample values from this distribution, we need to find its inverse.

A picture containing shoji

Description automatically generatedCDF-1 = t = ln(1-x) / -r

Now if we sample values between 0 and 1 into x, the function returns some t which is our interval.