Keywork: Gaussian Filtering, Gaussian Kernel, Fredholm convolution integral, Gausien blur, Truncated Gaussian, Fast Fourier Transform, Gaussian Hermite Quadrature, Quick algorithm,

Need to see

<https://math.stackexchange.com/questions/388009/numerical-approximation-of-the-continuous-fourier-transform>

<https://scicomp.stackexchange.com/questions/11233/amplitude-of-discrete-fourier-transform-of-gaussian-is-incorrect>

<https://itectec.com/matlab/matlab-discrete-fourier-transform-of-real-valued-gaussian-using-fft/>

Attention: there are different notions

* FT Continuous (time) Fourier Transform = continuous transformation of a continuous signal
* DTFT Discrete (time) Fourier Transform = continuous (frequency?) transformation of a discrete (time) signal
* DDF Discrete Fourier Transform = discrete transformation of a discrete signal. Fast Fourier Transform is a fast algorithm for DDF

<https://www.dsprelated.com/freebooks/sasp/Fourier_Transforms_Continuous_Discrete_Time_Frequency.html>

<https://physics.stackexchange.com/a/118596/307210>

**FT Continuous (time) Fourier Transform**

**DTFT Discrete (time) Fourier Transform**

The sequence

**Discrete (time) Fourier Transform** <https://en.wikipedia.org/wiki/Discrete_Fourier_transform>

The sequence is transformed to the sequence   by

Phase (Frequence) - Time

For a standard Gaussian function

* The continue Fourier Transform

What if I approximate

We have

Simplifier this formular over

For

We have

The function

The Fourier Transform

And then