

Problem Set 1

Dylan Lane

September 10, 2023

1 Background

My goal for this class is to develop a toolkit of techniques to draw from when doing research involving computation while developing intuition for assessing errors and improving algorithms. In addition, I would enjoy a look at more advanced computational techniques if time permits; for example, algorithms like Monte Carlo are a powerful and popular computational tool that would be a worthwhile topic of study. I have been doing research with Professor Pine which has been primarily computational, particularly using FDTD modules (MEEP) in Python to compute photonic bands and density of states for perfect lattice structures; having some notion of when something is going wrong, having a deeper understanding of what my code is doing, and having more options when writing my own functions will greatly benefit me. In addition to Python, I have taken two courses at NYU in Java. I plan to go to graduate school for physics (currently an undergraduate) and hope that this course will give me a firm foundation in computation moving forward.

2 Gaussian

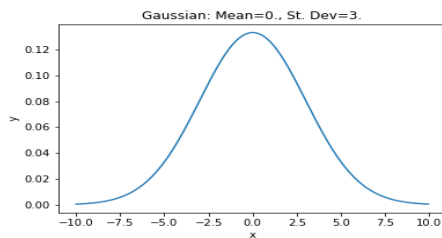


Figure 1: A Gaussian curve parameterized by $\mu = 0$, $\sigma = 3$ plotted on the interval $x = [-10, 10]$. Both x and y are assumed to be unitless.

3 Github

My Github username is: dl4729