

Color Plots

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July 30, 2021

In the Third Edition, we did many more surface plots (because we did much more with solving Poisson equations), which will always look better in color than in grayscale. So, this part of the website is devoted to reproducing color versions of each surface plot in the Third Edition. We aren't there, yet, but hope to be, soon.

Section 9.3—Difference Methods for Poisson Equations

9.3.1 Discretization and Examples

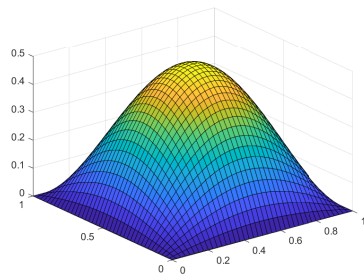


Figure 9.19: Surface plot of exact solution to (9.41) and (9.42).

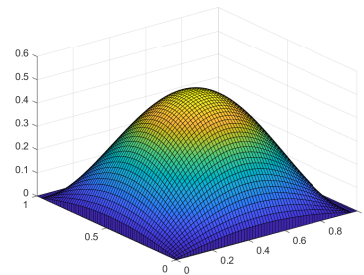


Figure 9.20: Naive (nonsparse) solution for Example 9.5, $N = 64$.

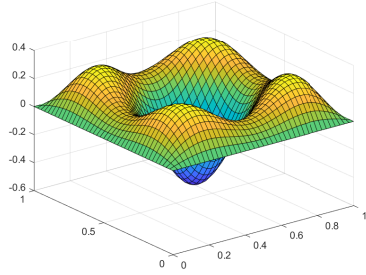


Figure 9.23: Exact solution for Example 9.6.

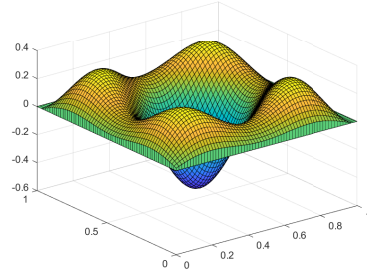


Figure 9.24: Approximate solution for Example 9.6, $h = \frac{1}{64}$, Sparse Naive case.

9.3.2 Higher Order Methods

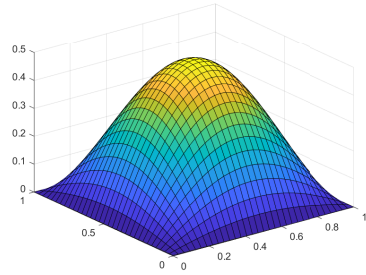


Figure 9.27: Approximate solution for $N = 32$, for Example 9.5, using the Collatz scheme.

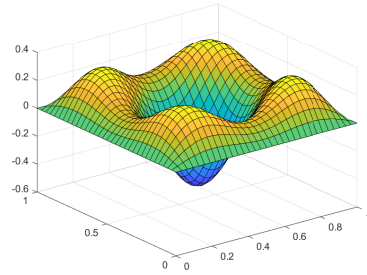


Figure 9.29: Approximate solution for $N = 32$, for Example 9.6, using the Collatz scheme.

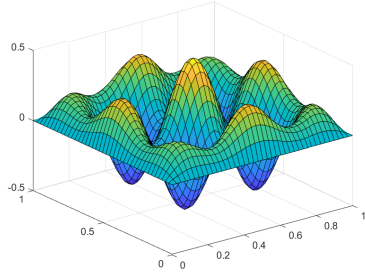


Figure 9.31: Exact solution for Example 9.9.

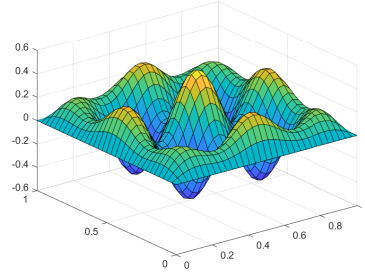


Figure 9.32: Approximate solution for $N = 32$, for Example 9.9, using the Collatz scheme.

10.2 Spectral Methods in Two Dimensions

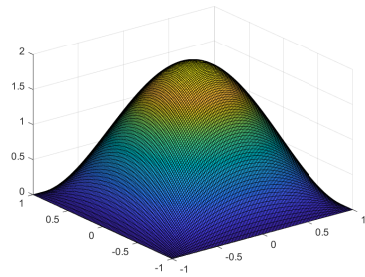


Figure 10.18: Exact solution to Example 10.4.

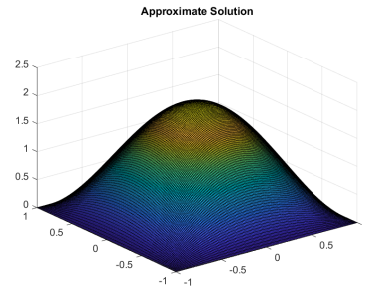


Figure 10.19: Spectral solution to Example 10.4 for $n = 8$.

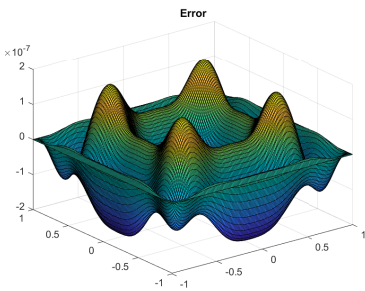


Figure 10.20: Error in spectral solution to Example 10.4, $n = 8$ case.

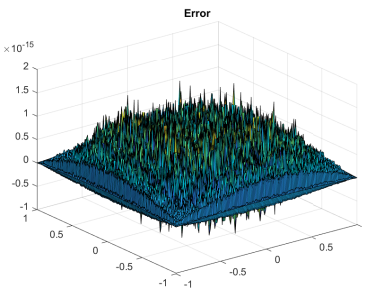


Figure 10.23: Error for Example 10.4, $N = 16$.

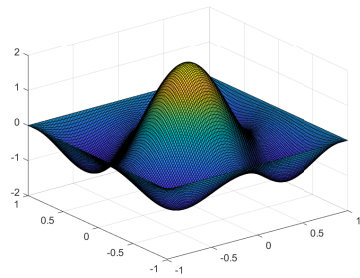


Figure 10.25: Exact solution for Example 10.5.

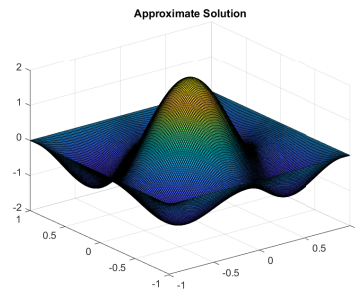


Figure 10.27: Spectral solution to Example 10.5 for $n = 16$.

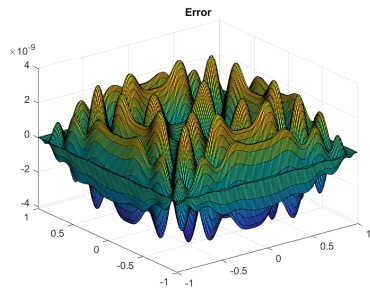


Figure 10.28: Error in spectral solution to Example 10.5, $n = 16$ case.

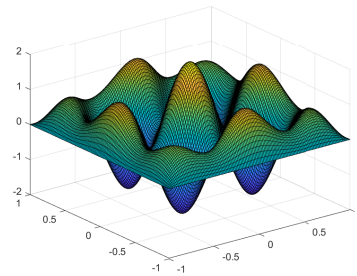


Figure 10.30: Exact solution for Example 10.6.

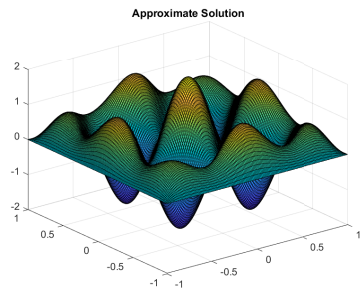


Figure 10.31: Spectral solution to Example 10.6 for $n = 16$.

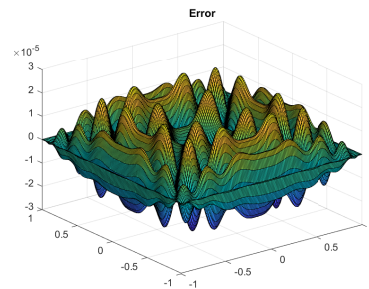


Figure 10.32: Error in spectral solution to Example 10.6, $n = 16$ case.