

# Numerical Analysis of Convergence Speed in Heat Equation Seminar Talk

Student: Pavel Prudnikov  
Scientific supervisor: Ivan Remizov

Research group: Evolution equations and applications  
National Research University Higher School of Economics

24.08.2020

# Initial condition and solution

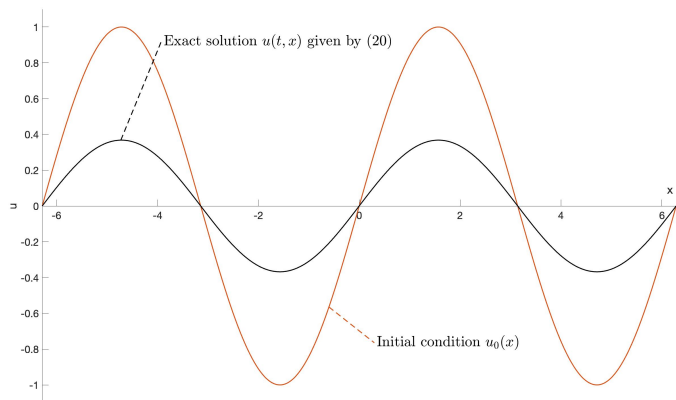


Figure 1: Graphs of initial condition and solution of the heat equation ( $t = 1$ )

# Convergence visualization. Part I

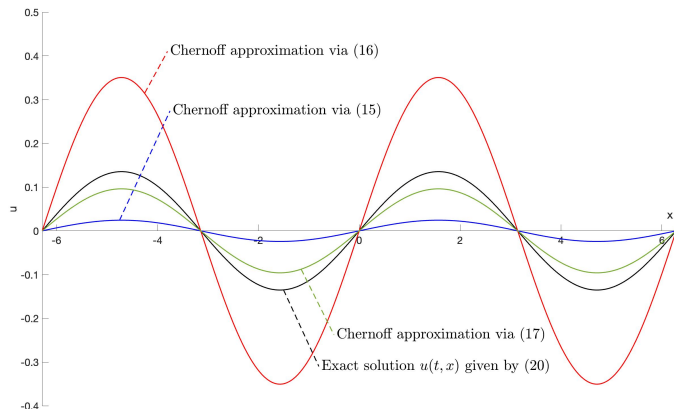


Figure 2: Graphs of approximations to the solution of the heat equation  
( $t = 2$ ,  $n = 1$ )

## Convergence visualization. Part II

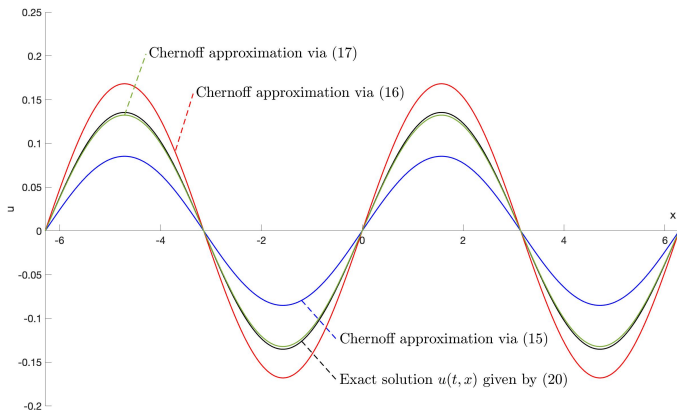


Figure 3: Graphs of approximations to the solution of the heat equation ( $t = 2$ ,  $n = 2$ )

# Convergence speed approximation. Standard

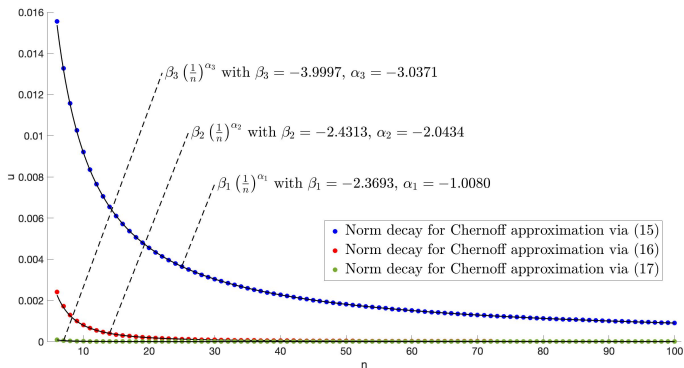


Figure 4: Graphs of estimates of the convergence speed ( $t = 2$ )

# Convergence speed approximation. Log-log

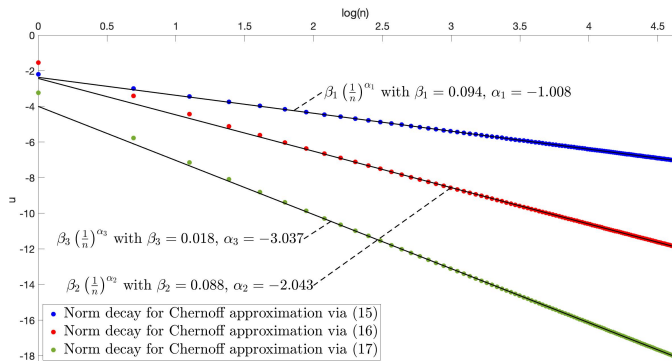


Figure 5: Graphs of estimates of the convergence speed with log-log scale ( $t = 2$ )

# Initial condition and solution

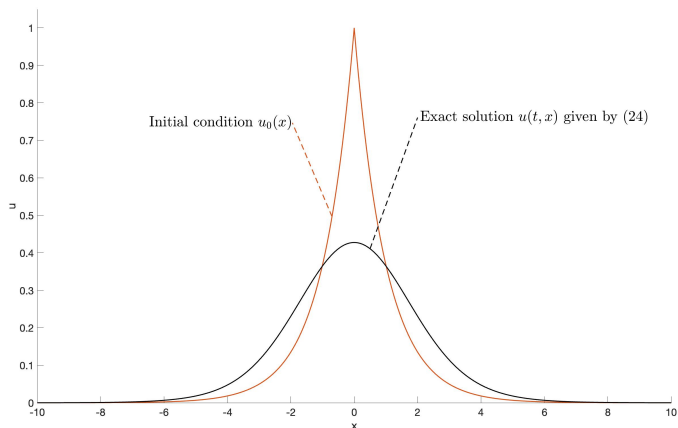


Figure 6: Graphs of initial condition and solution of the heat equation ( $t = 1$ )

# Convergence visualization. Part I

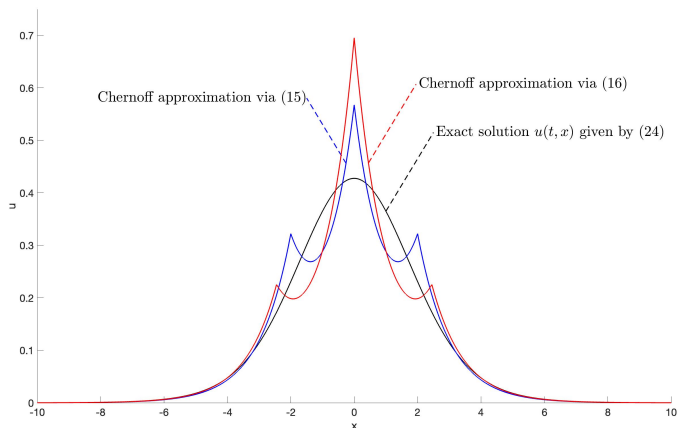


Figure 7: Graphs of approximations to the solution of the heat equation ( $t = 1$ ,  $n = 1$ )



## Convergence visualization. Part II

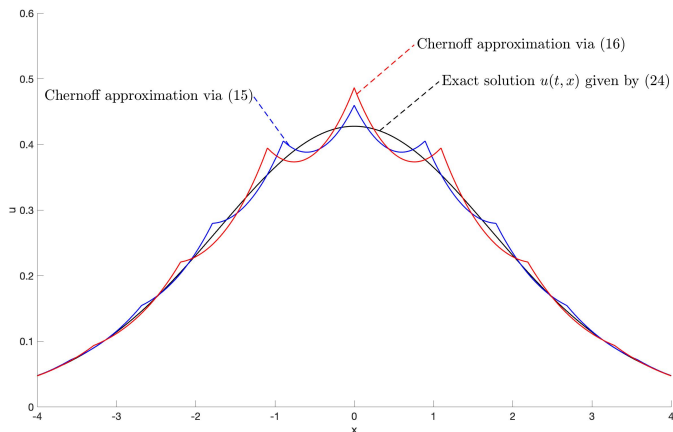


Figure 8: Graphs of approximations to the solution of the heat equation ( $t = 1$ ,  $n = 5$ )

# Convergence speed approximation. Standard

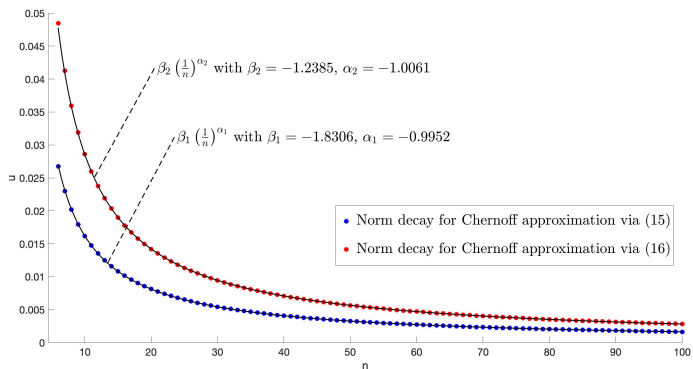


Figure 9: Graphs of estimates of the convergence speed ( $t = 1$ )

# Convergence speed approximation. Log-log

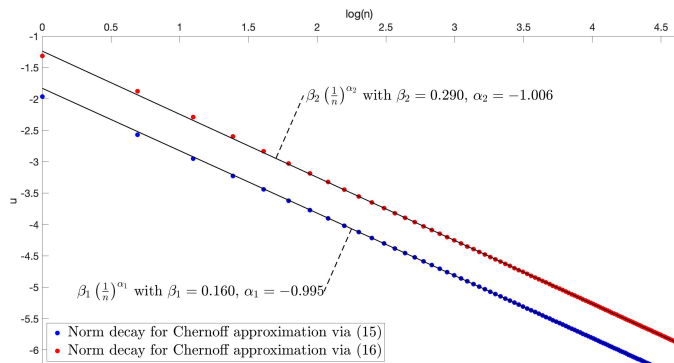


Figure 10: Graphs of estimates of the convergence speed with log-log scale ( $t = 1$ )

Thank you for your attention!