Case Study III: Boundary-Value Problems
MTH 3150: Numerical Methods and Scientific Computing
Franklin W. Olin College of Engineering

Event Detection

Develop and implement an algorithm in MATLAB to find the range
of the baseball with drag to within a given tolerance, using your ode
solver and your root-finder. Write a brief review of your method, im-
plementation, and results using code snippets as evidence. Include a
graph of the range versus the drag coefficient obtained by continua-
tion.

Shooting Methods for BVPs

Develop and implement an algorithm in MATLAB to solve the follow-
ing boundary-value problem,

$$v'' + 2xv' - x^2v = x^2, \ v(0) = 1, v(1) = 0, \tag{1}$$

by the shooting method using your ode solver and your root-finder
to within a given tolerance. Write a brief review of your method,
implementation, and results using code snippets as evidence.