

# Finite Difference Methods for Partial Differential Equations: Part 1

Adnan H. Sabuwala

November 6, 2008

## **Abstract**

Partial differential equations (PDE's) appear in a variety of physical problems. In an introductory numerical partial differential equations class, one studies the various kinds of equations that govern physical phenomena along with the techniques of solving them. Many a times separation of variables is used to arrive at closed-form solutions to such boundary value problems. However, it is often not possible to solve them analytically and one needs to resort to numerical methods in solving such equations. In this talk, my goal is going to be to introduce you to one of the numerical techniques, namely, finite difference methods. This talk will be a very basic introduction to the idea behind finite differences along with terminologies associated with them. Prior knowledge of linear algebra will be helpful but for most part of the talk, I will try to keep it at a level accessible to a typical undergraduate mathematics major.