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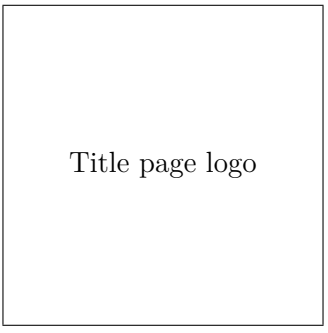

Abstract Dummy Page.

"These violent delights have violent ends"
(Romeo and Juliet: Act 2, Scene 6, Line 9)

Sammanfattning

Jag skriver på svenska här.

Преглед

Ова теза злата вреди!

List of papers

This thesis is based on the following papers, which are referred to in the text by their Roman numerals.

I Radial Basis Function generated Finite Differences for Option Pricing Problems

II BENCHOP — The BENCHmarking Project in Option Pricing

III BENCHOP-SLV: The BENCHmarking project in Option Pricing — Stochastic and Local Volatility problems

IV Pricing Derivatives under Multiple Stochastic Factors by Localized Radial Basis Function Methods

V Pricing Financial Derivatives using Radial Basis Function generated Finite Differences with Polyharmonic Splines on Smoothly Varying Node Layouts

VI SMOOTHING PAPER TITLE

Contents

1. Introduction

The purpose of this thesis is to report on development, properties, and state of the art for the Radial Basis Function generated Finite Difference (RBF-FD) method, when used for pricing of financial derivatives.

Across the markets of the world, financial derivatives are traded in

Many of the theoretical pricing models for financial derivatives can be represented using partial differential equations (PDEs). In great deal of cases, those equations are time-dependent, high-dimensional, and impossible to solve analytically — therefore, requiring numerical approximation as a mean to estimate their solution.

On the other hand, RBF-FD is a method that is developed exactly for that. RBF-FD, as its name suggests, is a finite difference type of a method from the radial basis function family. Such methods are mainly developed for numerical approximation of differential operators which is a crucial building block for many solvers partial differential equations (PDEs).

This manuscript is organized in the following way.

2. Financial Derivatives

1 1 2 2 3 3 Introduce financial derivatives. $S = S_0 + \alpha \int_j = 1^N x \mathrm{d}x$. Start with simple reasoning of necessity for the agreed prices in the future and then generalize towards options. Hedging risks. Say a bit on importance of knowing the fair price. Talk about options, futures, and other derivatives. Explain the Greeks. Definitions.

$$W_0 = \frac{\partial u}{\partial t} \int_{i=1}^{M} x \mathrm{d}x. \tag{2.1}$$

2.1 Futures

2.2 Options

3. Option Pricing

Talk about stochastic and deterministic formulation.

3.1 Market Models

State, motivate and explain the models used in BENCHOP.

3.2 Pricing Methods

Talk about all the method groups from BENCHOP.

4. Radial Basis Function generated Finite Difference Methods

Similar to explanation in our papers, a bit of history and the method evolution throughout the papers.

4.1 Choosing Shape Parameters

4.2 Constructing Node Layouts

4.3 Smoothing Payoff Functions

5. Outlook and Further Development

Sumarize.

Acknowledgements

Wohoo!