

# **Essentially Non-Oscillatory Schemes**

simple guide

**Chengsi ZHOU**

# Table of Contents

## **1 One Space Dimension**

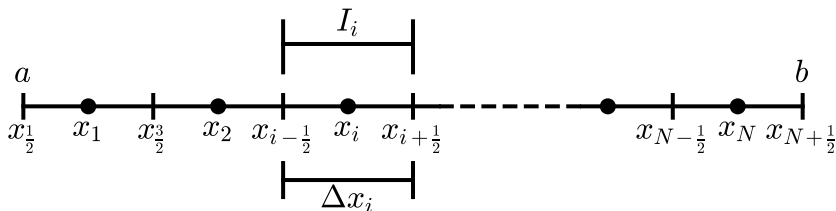
## **2 The Second Section**

- Example

# Definition of One Space Dimension

Given a grid

$$a = x_{\frac{1}{2}} < x_{\frac{3}{2}} < \dots < x_{N-\frac{1}{2}} < x_{N+\frac{1}{2}} = b$$



We define

**Cells**  $I_i = [x_{i-\frac{1}{2}}, x_{i+\frac{1}{2}}]$

**Cell centers**  $x_i = \frac{1}{2}(x_{i-\frac{1}{2}} + x_{i+\frac{1}{2}})$

**Cell sizes**  $\Delta x = x_{i+\frac{1}{2}} - x_{i-\frac{1}{2}}$

# One Dimensional Reconstruction

Given the cell averages of a function  $v(x)$

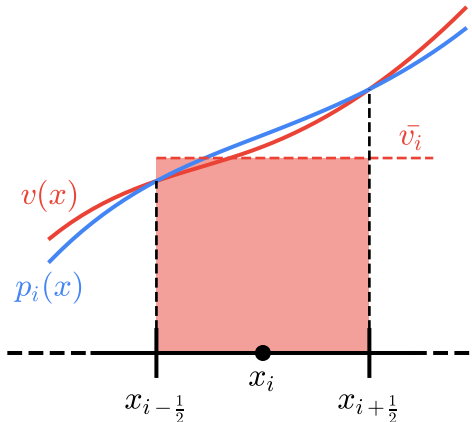
$$\bar{v}_i \equiv \frac{1}{\Delta x_i} \int_{x_{i-\frac{1}{2}}}^{x_{i+\frac{1}{2}}} v(\xi) d\xi$$

find a polynomial  $p_i(x)$ , of degree at most  $k-1$ , for each cell  $I_i$ . It is a  $k$ -th order accurate approximation to  $v(x)$

$$p_i(x) = v(x) + O(\Delta x^k)$$

$$x \in I_i$$

$$i = 1, \dots, N$$



This is a Block

This is important information

This is an Alert block

This is an important alert

This is an Example block

This is an example

# Example of columns 1

There are two handy environments for structuring a slide: "blocks", which divide the slide (horizontally) into headed sections, and "columns" which divides a slide (vertically) into columns. Blocks and columns can be used inside each other.

There are two handy environments for structuring a slide: "blocks", which divide the slide (horizontally) into headed sections, and "columns" which divides a slide (vertically) into columns. Blocks and columns can be used inside each other.  
into two lines

# Mathematics

## Example

The function  $\phi: \mathbb{R} \rightarrow \mathbb{R}$  given by  $\phi(x) = 2x$  is continuous at the point  $x = \alpha$ , because if  $\epsilon > 0$  and  $x \in \mathbb{R}$  is such that  $|x - \alpha| < \delta = \frac{\epsilon}{2}$ , then

$$|\phi(x) - \phi(\alpha)| = 2|x - \alpha| < 2\delta = \epsilon.$$