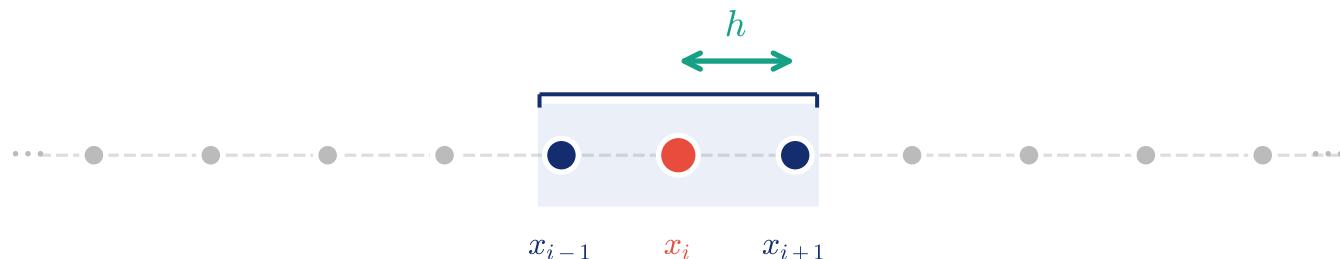
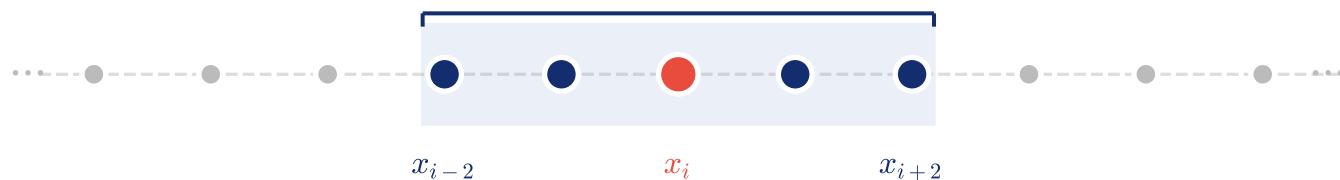


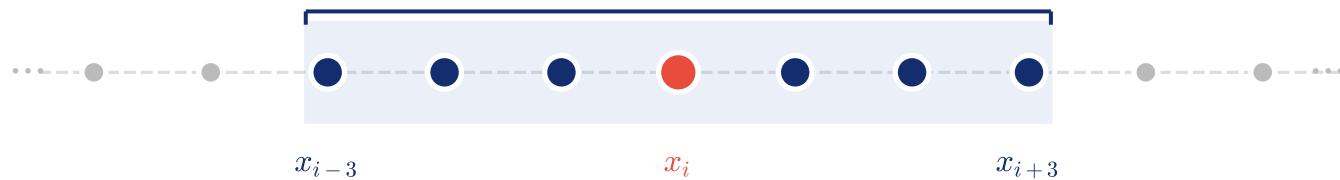
Finite Difference Stencils: From Local to Global



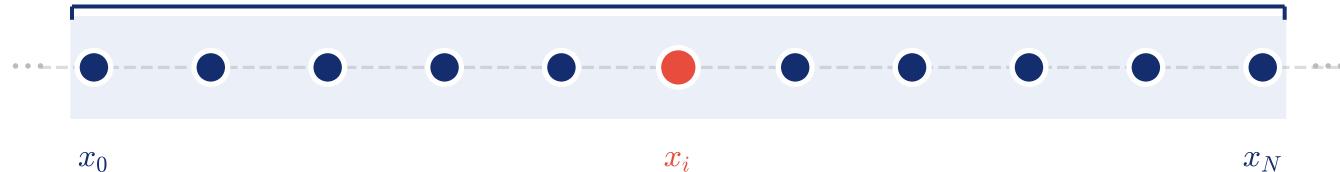
2nd order FD (3 points)



4th order FD (5 points)



6th order FD (7 points)



Spectral (all points)

As stencil width increases, accuracy improves. The spectral method is the limit: all nodes contribute to $u'(x_i)$.