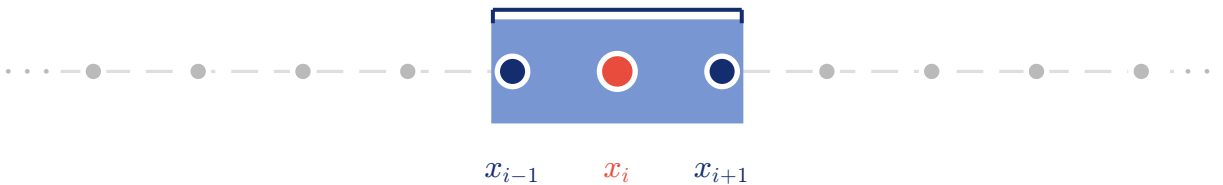


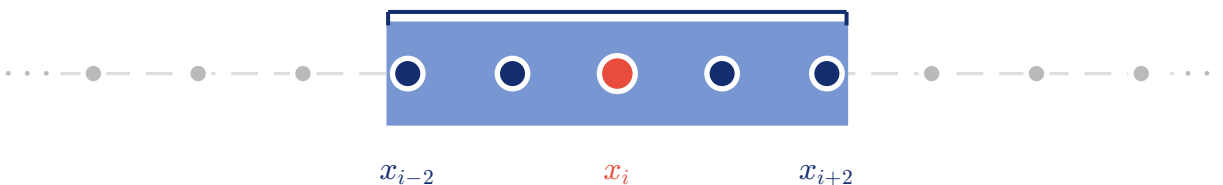
# Finite Difference Stencils: From Local to Global



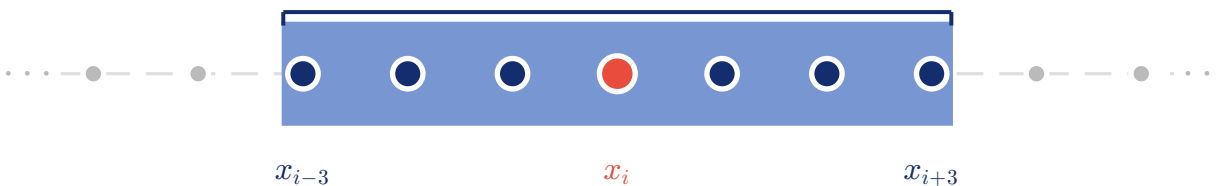
$h$



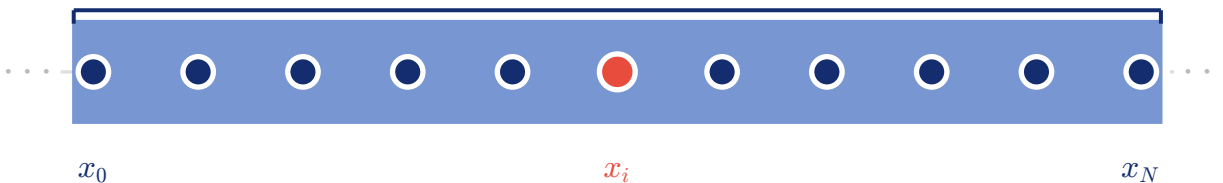
2nd order FD (3 points)



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  $u'(x_i)$ .