$$\mathbf{G}_i = \mathbf{x}_i \left\{ egin{array}{c} \mathbf{p}_i \\ \mathbf{R}_i \end{array} \right. \left. egin{array}{c} \mathbf{p}_j \\ \mathbf{R}_j \\ \mathbf{v}_j \end{array} \right\} \mathbf{x}_j$$

$$\mathbf{g} \qquad \mathbf{g} \qquad \mathbf{g} \qquad \mathbf{p}_i + \mathbf{v}_i \Delta t + \frac{1}{2} \mathbf{g} \Delta t^2 \\ \mathbf{R}_i \\ \mathbf{v}_i + \mathbf{g} \Delta t \end{array} \right\} \mathcal{G}_j$$