Particle filter

$$t = 1$$

Compute weights

$$w_1^{(k)} \propto \frac{p\left(\mathbf{x}_1^{(k)}|\mathbf{y}_1,\theta\right)}{q\left(\mathbf{x}_1^{(k)}|\mathbf{y}_1,\theta\right)}$$

$$\mathbf{x}_1^{(1)} \qquad \mathbf{x}_1^{(2)} \qquad \mathbf{x}_1^{(3)} \qquad \mathbf{x}_1^{(4)} \qquad \mathbf{x}_1^{(5)}$$