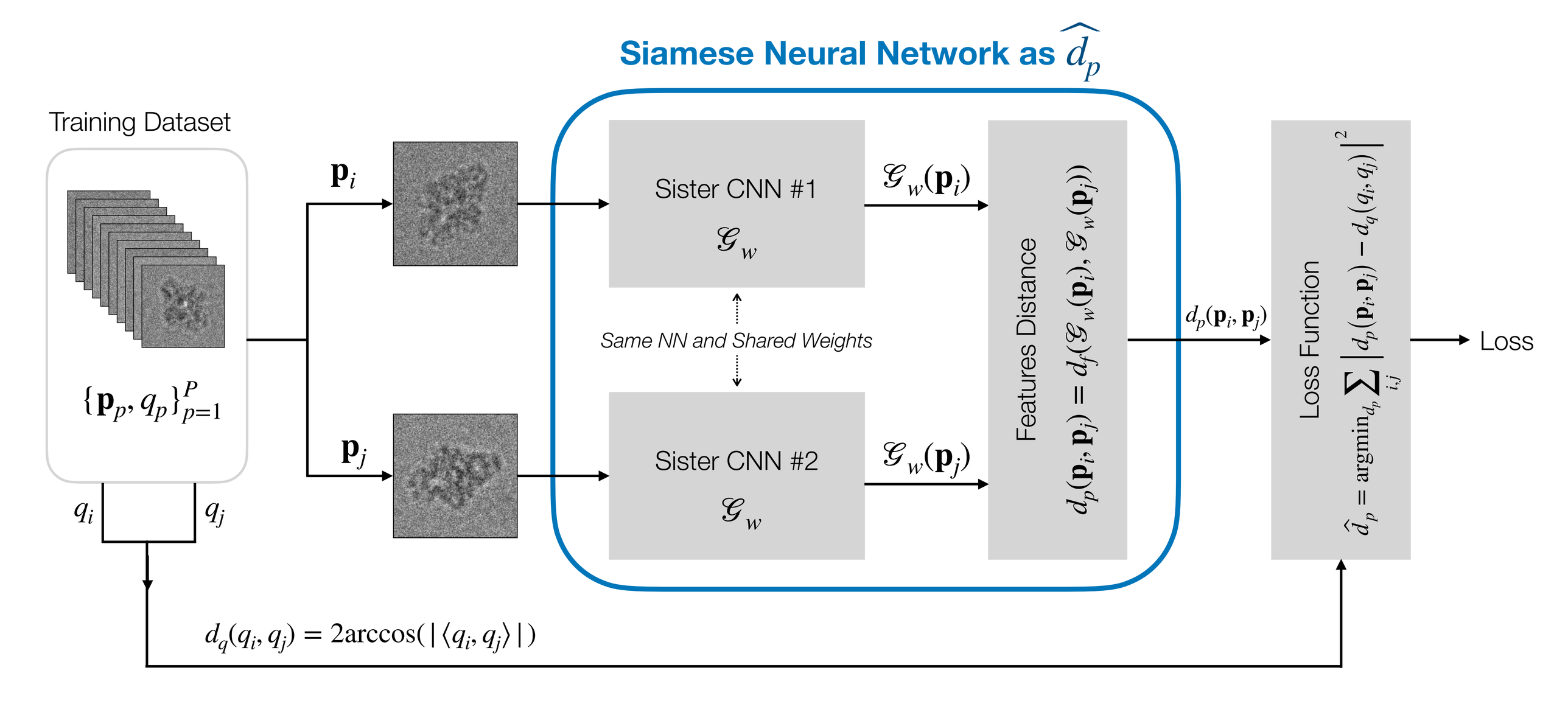
Siamese Neural Network as $\widehat{d_p}$
Training Dataset
$\{\mathbf{p}_p, q_p\}_{p=1}^{P}$
q_i
q_j
$\mathbf{p}_i$
$\mathbf{p}_j$
Sister CNN #1
$\mathscr{G}_w$
Same NN and Shared Weights
Sister CNN #2
$\mathscr{G}_w$
$\mathscr{G}_w(\mathbf{p}_i)$
$\mathscr{G}_w(\mathbf{p}_j)$
Features Distance
$d_p(\mathbf{p}_i, \mathbf{p}_j) = d_f(\mathscr{G}_w(\mathbf{p}_i), \mathscr{G}_w(\mathbf{p}_j))$
$d_p(\mathbf{p}_i, \mathbf{p}_j)$
Loss Function
$\hat{d}_p = \text{argmin}_{d_p} \sum_{i,j} \left| d_p(\mathbf{p}_i, \mathbf{p}_j) - d_q(q_i, q_j) \right|^2$
Loss
$d_q(q_i, q_j) = 2\arccos(|\langle q_i, q_j \rangle|)$