**Algorithm 1** Implicit Neural Teaching

**Input:** Target signal $f^*$, initial MLP $f_{\theta^0}$, the size of selected training size $k \leq N$, small constant $\epsilon > 0$ and maximal iteration number $T$.

Set $f_{\theta^t} \leftarrow f_{\theta^0}$, $t = 0$.

**while** $t \leq T$ and $\left\| \left[ f_{\theta^t}(\boldsymbol{x}_i) - f^*(\boldsymbol{x}_i) \right]_N \right\|_2 \geq \epsilon$ **do**

**The teacher** selects $k$ teaching examples:

/* Examples corresponding to the $k$ largest $\left| f_{\theta^t}(\boldsymbol{x}_i) - f^*(\boldsymbol{x}_i) \right|$. */

$$\{\boldsymbol{x}_i\}_k{}^* = \underset{\{\boldsymbol{x}_i\}_k \subseteq \{\boldsymbol{x}_i\}_N}{\arg\max} \left\| \left[ f_{\theta^t}(\boldsymbol{x}_i) - f^*(\boldsymbol{x}_i) \right]_k \right\|_2.$$

Provide $\{\boldsymbol{x}_i\}_k{}^*$ to the MLP learner.

**The learner** updates $f_{\theta^t}$ based on received $\{\boldsymbol{x}_i\}_k{}^*$:

// Parameter-based gradient descent.

$$\theta^t \leftarrow \theta^t - \frac{\eta}{k} \sum_{\boldsymbol{x}_i \in \{\boldsymbol{x}_i\}_k{}^*} \nabla_\theta \mathcal{L}(f_{\theta^t}(\boldsymbol{x}_i), f^*(\boldsymbol{x}_i)).$$

Set $t \leftarrow t + 1$.

**end**