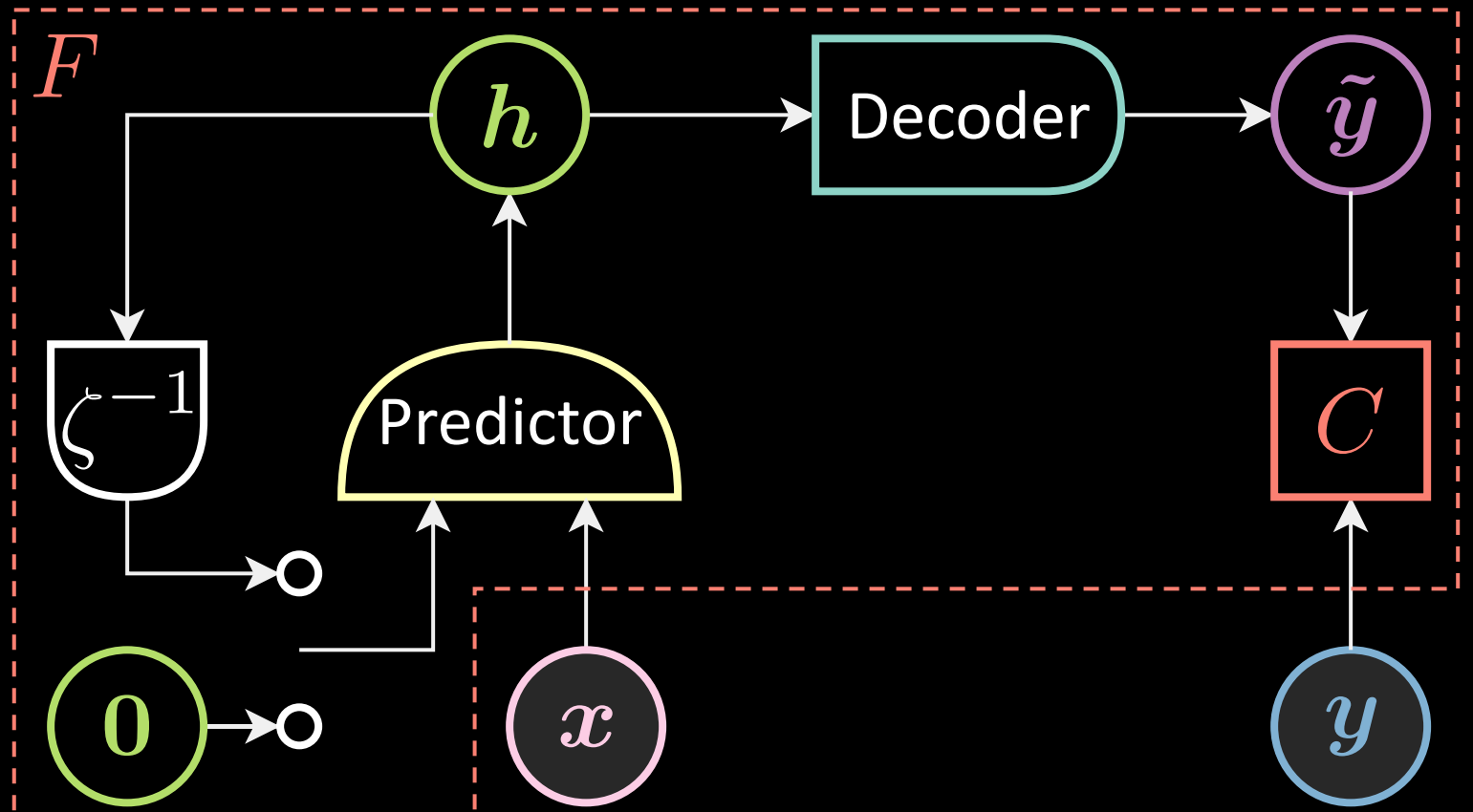
Recurrent Neural Nets

Handling sequential data

RNN diagram

$$F(\boldsymbol{x}, \boldsymbol{y}) =$$

$$\sum_{t=1}^{T} C(\boldsymbol{y}[t], \tilde{\boldsymbol{y}}[t])$$

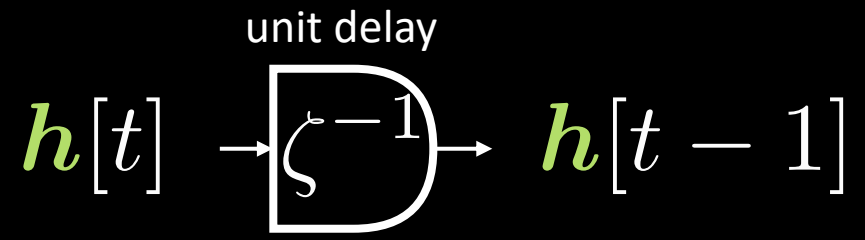


RNN equations

$$\boldsymbol{h}[0] \doteq \mathbf{0}$$

$$\boldsymbol{h}[t] = \mathrm{Pred}(\boldsymbol{h}[t-1], \boldsymbol{x}[t])$$

$$\tilde{\boldsymbol{y}}[t] = \mathrm{Dec}(\boldsymbol{h}[t])$$



RNN training

- backprop through time
- SGD wrt model's params to match ***x*** and ***y***

RNN training

$$\boldsymbol{h}[t] = \mathrm{Pred}(\boldsymbol{h}[t-1], \boldsymbol{x}[t])$$

$$\tilde{\boldsymbol{y}}[t] = \mathrm{Dec}(\boldsymbol{h}[t])$$