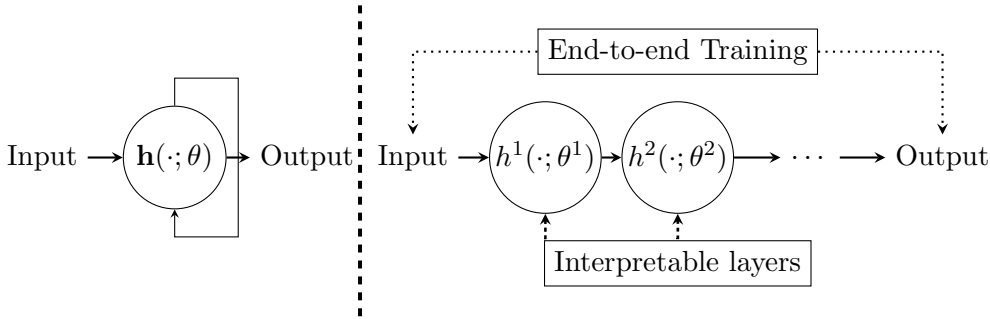
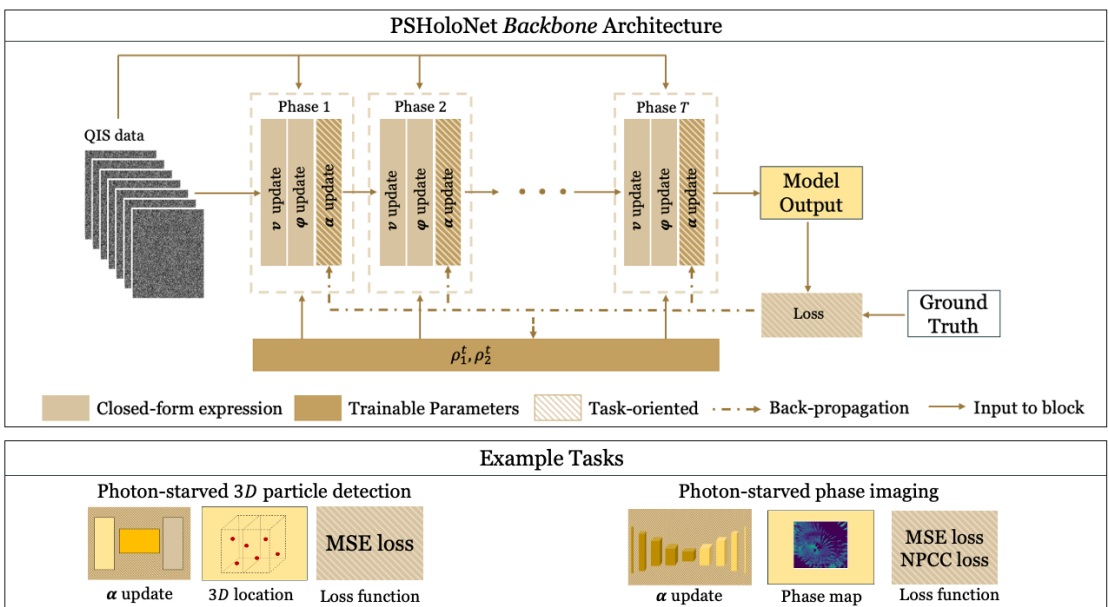
(a)


Input
$\mathbf{h}(\cdot;\theta)$
Output
End-to-end Training
Input
$h^1(\cdot;\theta^1)$
$h^2(\cdot;\theta^2)$
$\cdots$
Output
Interpretable layers

(b)


PSHoloNet *Backbone* Architecture
QIS data
Phase 1
Phase 2
Phase T
ν update
φ update
α update
Model Output
Loss
Ground Truth
ρ_1^t, ρ_2^t
Closed-form expression
Trainable Parameters
Task-oriented
Back-propagation
Input to block
Example Tasks
Photon-starved 3D particle detection
α update
3D location
MSE loss
Loss function
Photon-starved phase imaging
α update
Phase map
MSE loss
NPCC loss
Loss function