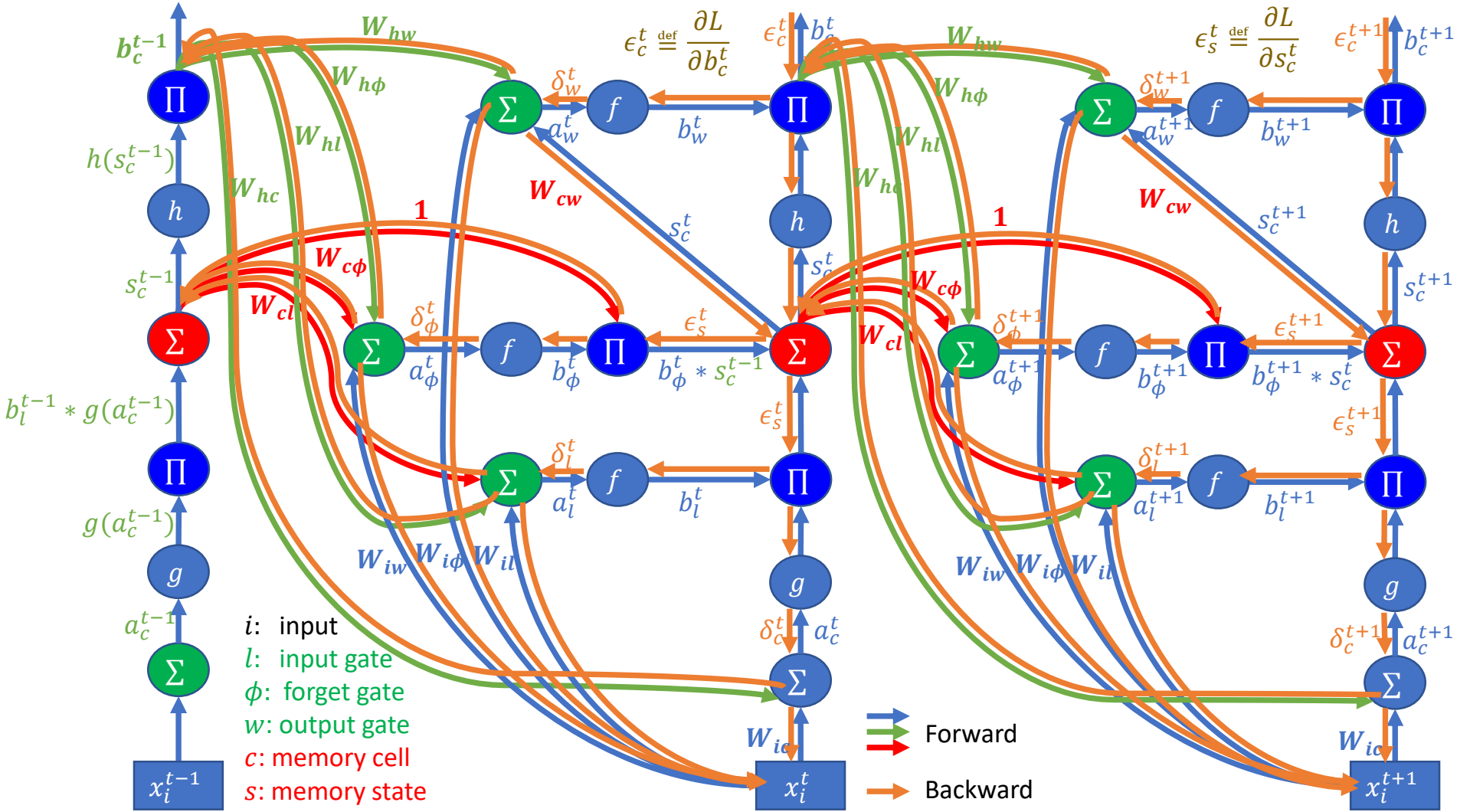
$\epsilon_c^t \stackrel{\text{def}}{=} \frac{\partial L}{\partial b_c^t}$
$\epsilon_s^t \stackrel{\text{def}}{=} \frac{\partial L}{\partial s_c^t}$
b_c^{t-1}
$h(s_c^{t-1})$
s_c^{t-1}
$b_l^{t-1} * g(a_c^{t-1})$
$g(a_c^{t-1})$
a_c^{t-1}
x_i^{t-1}
x_i^t
x_i^{t+1}
W_{hw}
$W_{h\phi}$
W_{hl}
W_{hc}
W_{cw}
$W_{c\phi}$
W_{cl}
W_{iw}
$W_{i\phi}$
W_{il}
W_{ic}
1
δ_w^t
a_w^t
b_w^t
s_c^t
δ_ϕ^t
a_ϕ^t
b_ϕ^t
$b_\phi^t * s_c^{t-1}$
ϵ_s^t
δ_l^t
a_l^t
b_l^t
δ_c^t
a_c^t
b_c^t
δ_w^{t+1}
a_w^{t+1}
b_w^{t+1}
s_c^{t+1}
δ_ϕ^{t+1}
a_ϕ^{t+1}
b_ϕ^{t+1}
$b_\phi^{t+1} * s_c^t$
ϵ_s^{t+1}
δ_l^{t+1}
a_l^{t+1}
b_l^{t+1}
δ_c^{t+1}
a_c^{t+1}
b_c^{t+1}
i: input
l: input gate
ϕ: forget gate
w: output gate
c: memory cell
s: memory state
Forward
Backward