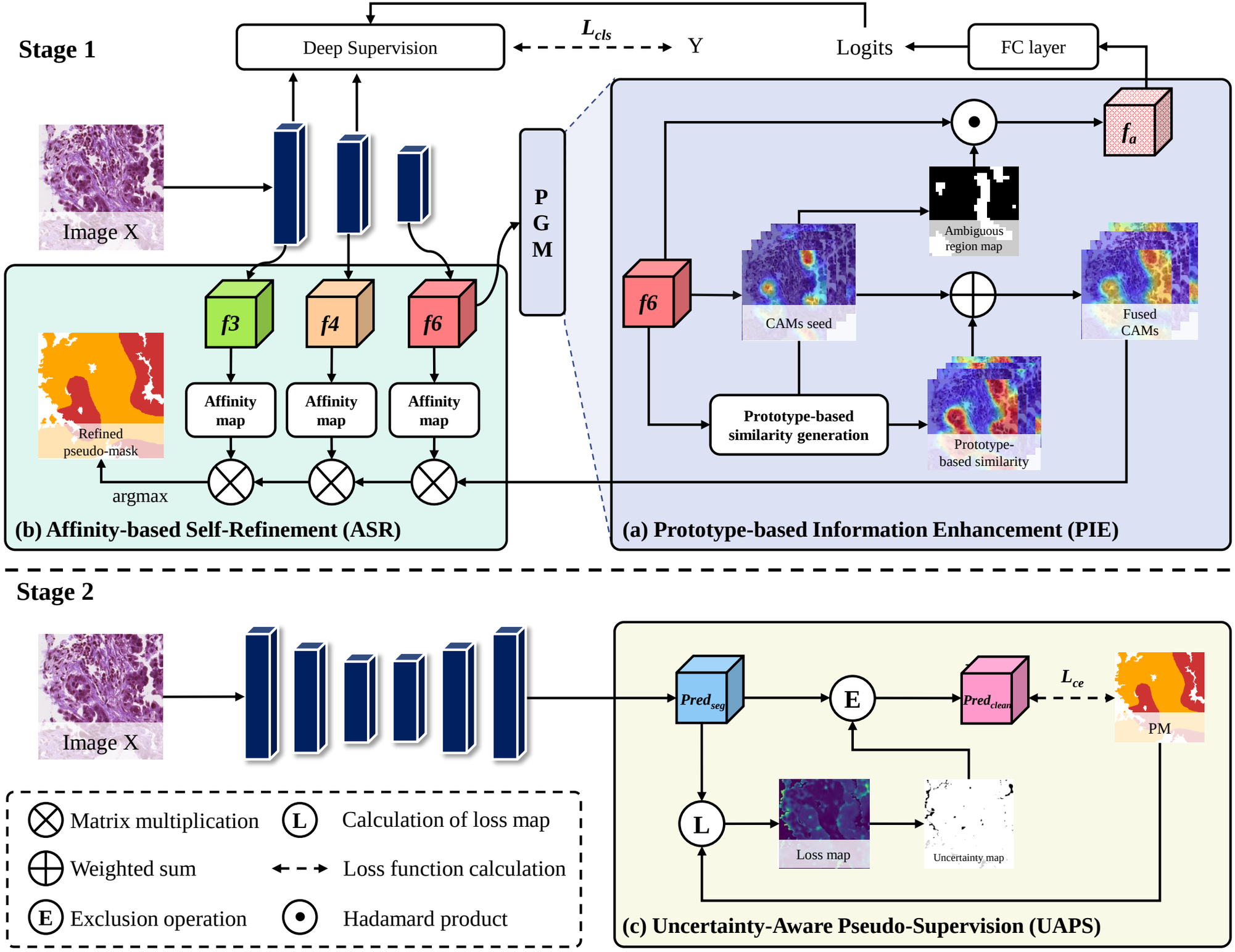
Stage 1
Deep Supervision
L_{cls}
Y
Logits
FC layer
Image X
P
G
M
f3
f4
f6
Affinity map
Affinity map
Affinity map
Refined pseudo-mask
argmax
(b) Affinity-based Self-Refinement (ASR)
f_a
Ambiguous region map
f6
CAMs seed
Fused CAMs
Prototype-based similarity generation
Prototype-based similarity
(a) Prototype-based Information Enhancement (PIE)
Stage 2
Image X
$Pred_{seg}$
E
$Pred_{clean}$
L_{ce}
PM
L
Loss map
Uncertainty map
(c) Uncertainty-Aware Pseudo-Supervision (UAPS)
Matrix multiplication
Calculation of loss map
Weighted sum
Loss function calculation
Exclusion operation
Hadamard product