ShaRPy: Shape Reconstruction and Hand Pose Estimation from RGB-D with Uncertainty

Supplementary Material

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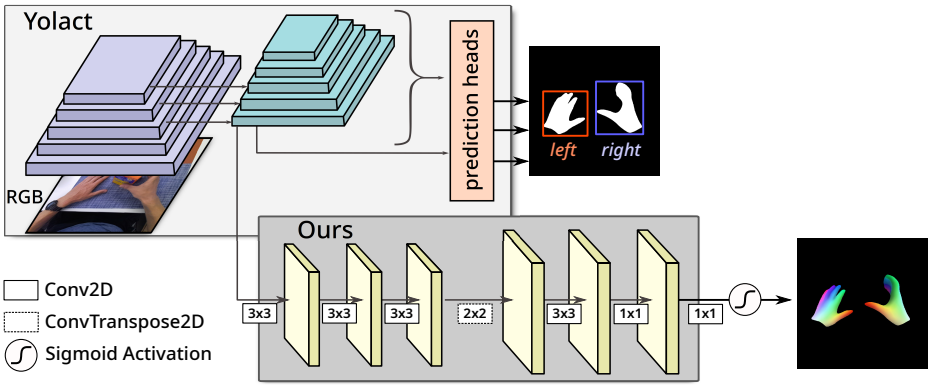

Figure 1: Overview of the operations used in our additional correspondence branch within the Yolact network.

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Symbol	Description	Value	
		PsA Patient	H2O
t_n	$\mathcal{C}_{3d}$ pruning normal threshold	0.05	0.10
t_d	$\mathcal{C}_{3d}$ pruning median depth threshold	0.15	0.15
t_{3d}	$\mathcal{C}_{3d}$ pruning distance threshold	0.10	0.10
ω_{point}	weight of point-to-point error	0.33	0.33
ω_{plane}	weight of point-to-plane error	0.66	0.66
ω_{shape}	weight of statistical shape regularizer	$1 \cdot 10^{-4}$	0.01
ω_{pose}	weight of statistical pose regularizer	$1 \cdot 10^{-3}$	$1 \cdot 10^{-3}$
$\omega_{\text{temp\_pose}}$	weight of temporal pose regularizer	$1 \cdot 10^{-3}$	$1 \cdot 10^{-3}$
$\omega_{\text{temp\_shape}}$	weight of temporal shape regularizer	0.01	0.01
ω_{3d}	weight of term E_{3d}	7.50	7.50
ω_{2d}	weight of term E_{2d}	0.70	0.10
ε_{2d}	error-prone pixel threshold	0.45	0.30
ε_{3d}	error-prone vertex threshold	0.03	0.03
τ_{2d}	error-prone pixel fraction threshold	0.55	0.40
τ_{3d}	error-prone vertex fraction threshold	0.30	0.50
τ_v	visibility fraction threshold	0.08	0.08
$it_{\text{L-BFGS}}$	L-BFGS iterations	5	
it_{Adam}	Adam iterations	50	
$\delta_{\text{L-BFGS}}$	L-BFGS learning rate	1	
δ_{Adam}	Adam learning rate	$0.01 \cdot 0.9^{\lfloor it/20 \rfloor}$ with $it = \{1, ..., it_{\text{Adam}}\}$	
δ	Yolact SGD learning rate	$1 \cdot 10^{-3}$	
λ	Yolact SGD weight decay	$5 \cdot 10^{-5}$	
μ	Yolact SGD momentum	0.85	

Table 1: Description and implementation of adaptable parameters in the ShaRPy pipeline.