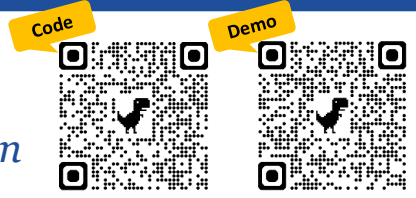


# From 20 Million Downloads to v2

## Advancing Bilateral Reference for High-Resolution Image Segmentation

BiRefNet v2 • Peng Zheng • University of Trento



**20M+**

downloads on HuggingFace

**70+**

top institutes & companies

**25M**

monthly visits to live demo

**\$100K+**

industry GPU sponsorship

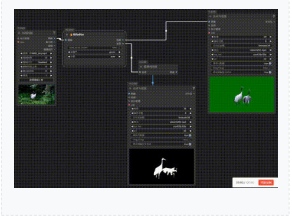
### What It's Used For

#### E-Commerce



Background removal for product photos — fashion, furniture, retail.

#### AIGC Workflows



Default preprocessing in ComfyUI, SD-WebUI, and IC-Light.

#### Portrait Matting



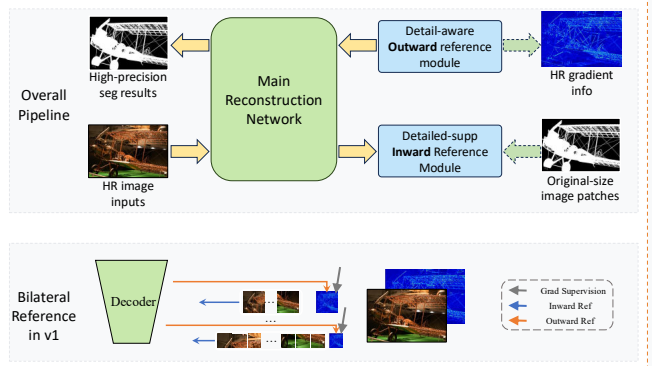
Professional-grade portrait cutouts for photography, video, social media.

#### 3D Generation



Clean object masks feeding 3D reconstruction and character pipelines.

### What's in v1

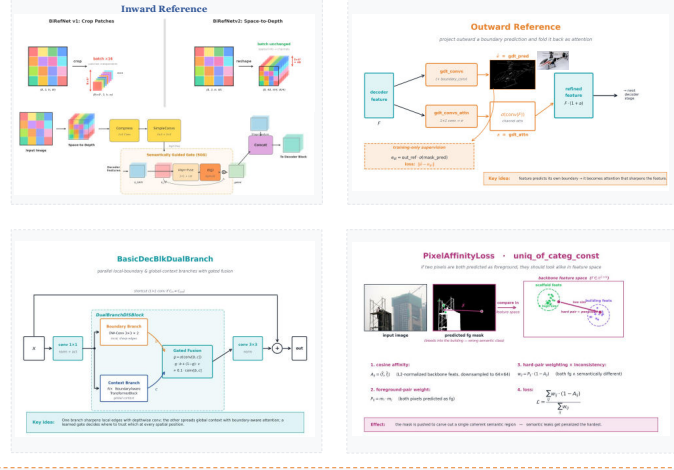


### What's New — v2

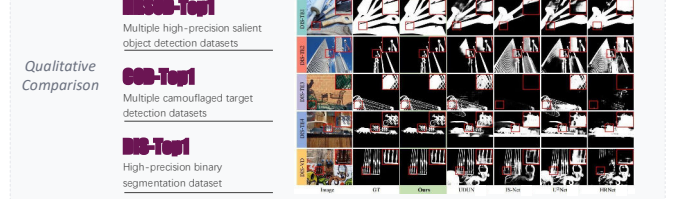
**NEW**

Building on everything we learned from millions of real users, BiRefNet 2 pushes the bilateral reference paradigm even further, such as **locality preservation**, **semantic purification**, etc.

#### v2 Architecture



### Results



**Quantitative Comparison**

TABLE 1  
Quantitative comparison on DISK. All methods use 1024 × 1024 input. “↑/↓” indicates higher/ lower is better. Best results are in bold, second best are underlined. Results for compared methods are taken from their respective papers [1]–[3], [6].

Methods	DIS-TE1 (500)				DIS-TE2 (500)				DIS-TE3 (500)			
	$F_2 \uparrow$	$F_3 \uparrow$	$M \downarrow$	$S_m \uparrow$	$F_2 \uparrow$	$F_3 \uparrow$	$M \downarrow$	$S_m \uparrow$	$F_2 \uparrow$	$F_3 \uparrow$	$M \downarrow$	$S_m \uparrow$
IS-Net <sub>22</sub> [1]	740	662	674	787	820	149	799	728	070	823	858	340
FP-DR <sub>21</sub> [7]	784	713	660	821	860	160	827	707	059	845	893	373
UDUN <sub>21</sub> [3]	784	720	699	817	864	140	829	768	058	843	886	325
IoSPyReNet <sub>21</sub> [1]	894	788	683	873	874	-	919	846	036	905	916	-
BiRefNet <sub>v1</sub> [1]	860	819	637	885	911	126	894	857	036	900	900	266
MVANet <sub>21</sub> [1]	916	823	637	879	911	-	929	874	030	915	944	-
DHIDNet <sub>21</sub> [1]	917	862	630	891	933	-	934	895	026	913	931	-
BiRefNet 2	936	864	626	913	921	97	936	898	023	931	936	231
937	897	625	919	964	-	937	907	025	928	955	879	-

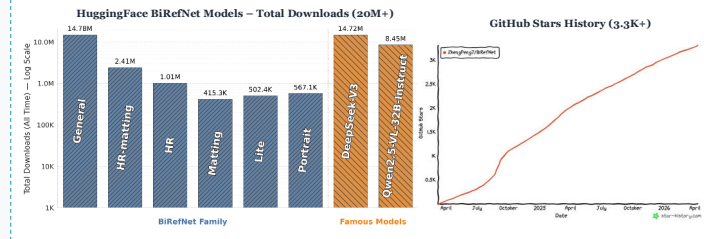
  

Methods	DIS-TE4 (500)				DIS-TE Q-4 (2,000)				DIS-VD (470)			
	$F_2 \uparrow$	$F_3 \uparrow$	$M \downarrow$	$S_m \uparrow$	$F_2 \uparrow$	$F_3 \uparrow$	$M \downarrow$	$S_m \uparrow$	$F_2 \uparrow$	$F_3 \uparrow$	$M \downarrow$	$S_m \uparrow$
IS-Net <sub>22</sub> [1]	827	753	672	830	870	2888	799	726	070	819	858	1016
FP-DR <sub>21</sub> [7]	846	788	661	852	906	3347	831	770	047	847	895	1165
UDUN <sub>21</sub> [3]	846	792	659	849	901	2785	831	772	057	844	902	977
IoSPyReNet <sub>21</sub> [1]	891	848	642	905	936	-	902	838	039	900	916	-
BiRefNet <sub>v1</sub> [1]	904	864	639	900	939	2223	896	858	035	901	934	916
MVANet <sub>21</sub> [1]	938	857	641	903	944	-	916	861	035	904	938	-
DHIDNet <sub>21</sub> [1]	911	892	632	896	945	-	918	886	028	905	941	-
BiRefNet 2	932	897	630	925	952	2169	925	894	026	925	942	744
931	901	602	925	955	808	-	931	902	025	932	955	808

### Who Uses It

#### Downloads vs. Famous Models

BiRefNet General alone (14.78M) rivals DeepSeek-V3 (14.72M) and Qwen2.5-VL-32B-Instruct (8.45M).

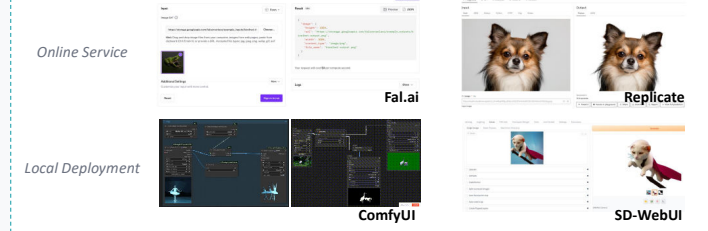


#### Recommended / Used by 70+ Famous Companies and Universities

Deployed by Microsoft Azure · featured by Cloudflare · used by MIT, Stanford, Google, Meta, and more.



### Where It Runs



### Sponsorship

Academic Work

Practical Applications

~\$100K GPU sponsor

The BiRefNet series includes 16 models: general seg/matting, portrait, edge-device, etc.

We've used a lot but **still need more GPU sponsorships.**