Towards Automated 2D Animation

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Images from Manga109[1]: © Courtesy of Ebihurai
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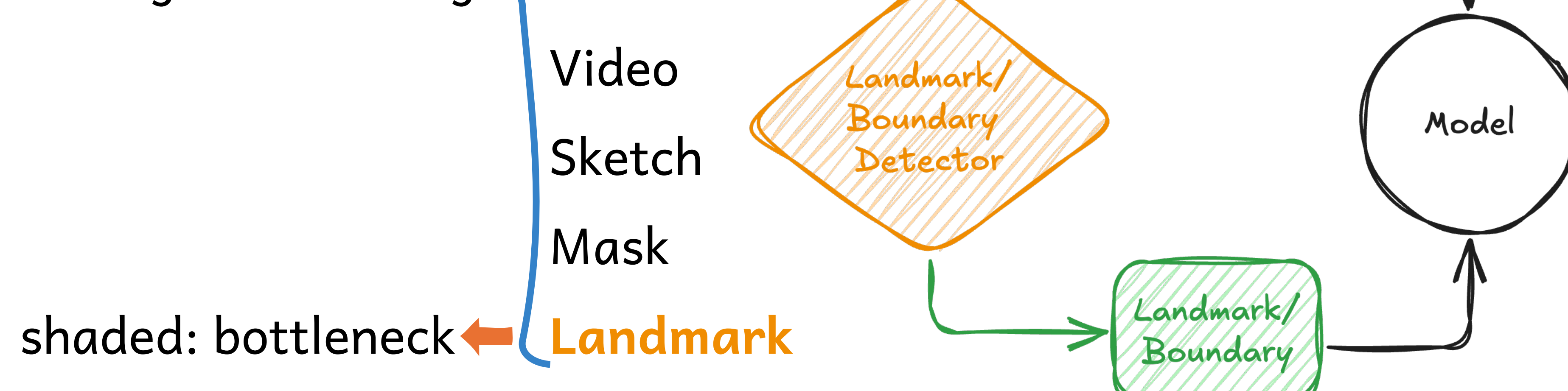© Courtesy of Kurosawa Tetsuya, Masaki Hidehisa

Abstract

✣ Landmark-guided human face manipulation

→ **Great progress:** Dataset ▸ Annotation ▸ Quality

✣ ≠ Landmark-guided cartoon face manipulation

→ **Challenges:** Variety, Artist-based, Annotation

✣ Starting with annotation: A step to help artists in the industry

✣ Simplify: Landmark Detection → Object Detection

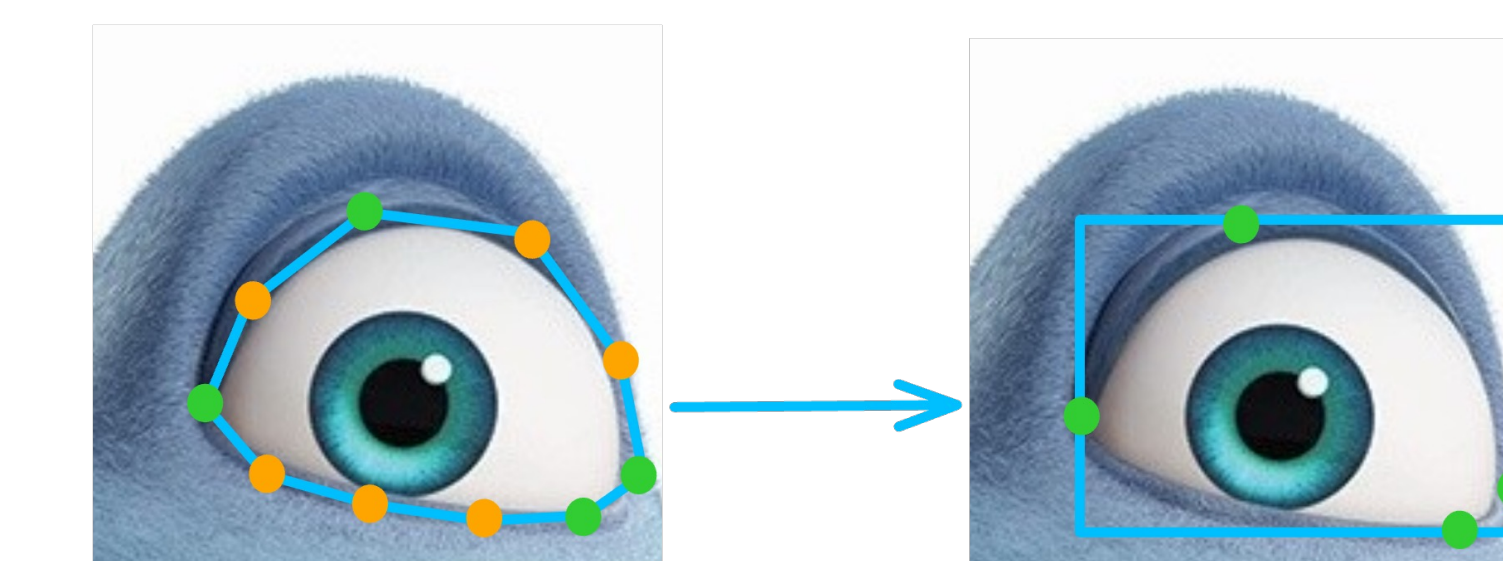**YOLOX-l**, **YOLOX-Tiny**, **Faster R-CNN**

Introduction

✣ Drawing keyframes → Time consuming

✣ Audience: Highly sensitive to faces & expressions

✣ Artists: Require control over the process

✣ 3D editing ⎨ 3DMM / Blendshapes

✣ 2D guided editing ⎨ Text / Video / Sketch / Mask

shaded: bottleneck ← **Landmark**

Input Image → Landmark/Boundary Detector → Landmark/Boundary → Model

✣ Checking top object detection models for the task

Dataset

✣ The only publicly available landmark annotation:

✣ Data: Manga109[1]

✣ Annotation: 2,105 faces with 60 landmarks[2]

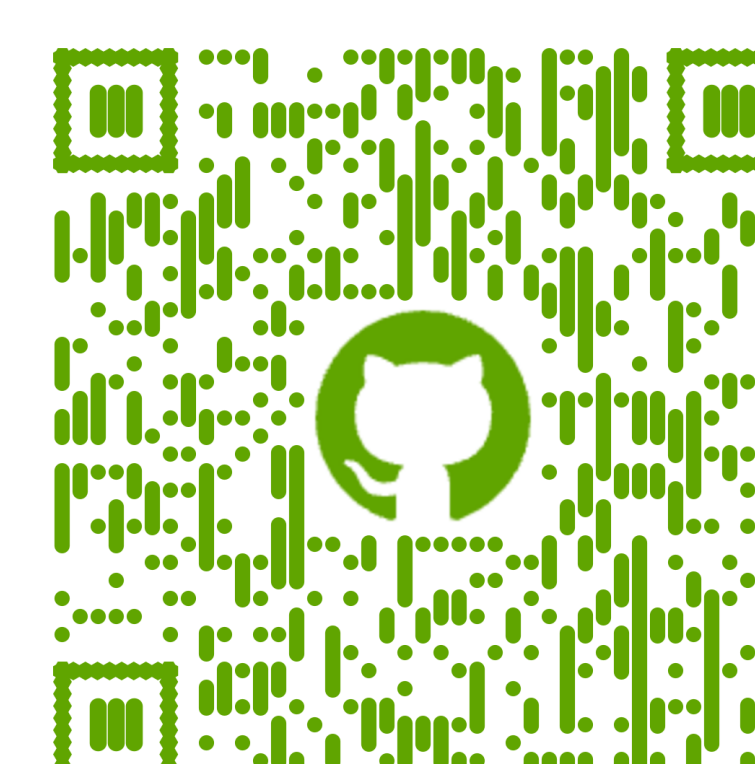✣ Getting boxes from landmarks:

✣ +15% increase for coverage

Experiments

*Frame Images: **Ground Truth**, **YOLOX-l**, **YOLOX-Tiny**, and **Faster R-CNN** detection results*

Models	mAP	AP_{eye}^{50}	AP_{mouth}^{50}	AP_{eye}^{75}	AP_{mouth}^{75}	$AP_{eye}^{50:95}$	$AP_{mouth}^{50:95}$
YOLOX-l	0.48	0.97	0.51	0.76	0.30	0.66	0.30
YOLOX-Tiny	0.57	0.95	0.84	0.71	0.54	0.62	0.52
Faster R-CNN	0.53	0.94	0.87	0.64	0.53	0.57	0.50

Models	FP^{eye}	FN^{eye}	FP^{mouth}	FN^{mouth}
YOLOX-l	1372	10	822	22
YOLOX-Tiny	138	19	133	29
Faster R-CNN	189	17	214	18

✣ Minimum FPs
✣ Acceptable FNs

References

[1] Matsui, Yusuke, et al. "Sketch-based manga retrieval using manga109 dataset." Multimedia tools and applications 76 (2017): 21811-21838.
[2] Stricker, Marco, et al. "Facial landmark detection for manga images." arXiv preprint arXiv:1811.03214 (2018).