Rapid identification method of fresh tea leaves based on lightweight model

Zhonghui Chen, Dengzhun Wang,Hongbo Fang, Guang Wang , and Benliang Xie

College of Big Data and Information Engineering, Guizhou University, China

e-mail: blxie@gzu.edu.cn

- By improving the MobileNetV2 network, the MobileNetV2-Tea model has obtained

- Depth-separable convolutional structure has less the computation of parameters

- Using attention optimization module

- builting anew average pooling layer and a new fully connected layer

MobileNetV2-Tea model

Input	Operate	Output	a	t	c	n	s
$224^2 \times 3$	Conv2d	$112^2 \times 32$	Y	-	32	1	2
$112^2 \times 32$	bottleneck	$112^2 \times 16$	N	1	16	1	1
$112^2 \times 16$	bottleneck	$56^2 \times 24$	Y	6	24	2	2
$56^2 \times 24$	bottleneck	$28^2 \times 32$	Y	6	32	3	2
$28^2 \times 32$	bottleneck	$14^2 \times 64$	Y	6	64	4	2
$14^2 \times 64$	bottleneck	$14^2 \times 96$	N	6	96	3	1
$14^2 \times 96$	bottleneck	$7^2 \times 160$	Y	6	160	3	2
$7^2 \times 160$	bottleneck	$7^2 \times 320$	N	6	320	1	1
$7^2 \times 320$	Conv2d 1×1	$7^2 \times 1280$	N	-	1280	1	1
$7^2 \times 1280$	Avgpool 3×3	$2^2 \times 1280$	-	-	-	1	3
$2^2 \times 1280$	Flatten	5210	-	-	-	-	-
5210	1024fc,ReLU	1024	-	-	-	-	-
1024	Batch Normal	1024	-	-	-	-	-
1024	Dropout	1024	-	-	-	-	-
1024	softmax	classfication	-	-	-	-	-

Model Comparasion

Model	Recognition accuracy	Model size	recognition time
MobileNetV2	94%	8.7M	42ms
VGG16	97%	512.2M	316ms
GoogLeNet	94%	21.5M	47ms
ResNet50	95%	89.97M	46ms
MobileNetV2-Tea	99%	28.86M	45ms