

Model: "ensemble_model"

Layer (type)	Output Shape	Param #	Connected to
ensemble_2_cnn_input (InputLayer)	(None, 256, 256, 1)	0	[]
ensemble_2_conv2d_20 (Conv2D)	(None, 256, 256, 32)	320	['ensemble_2_cnn_input[0][0]']
ensemble_2_activation_37 (Activation)	(None, 256, 256, 32)	0	['ensemble_2_conv2d_20[0][0]']
ensemble_2_batch_normalization_32 (BatchNormalization)	(None, 256, 256, 32)	128	['ensemble_2_activation_37[0][0]']
ensemble_2_max_pooling2d_20 (MaxPooling2D)	(None, 128, 128, 32)	0	['ensemble_2_batch_normalization_32[0][0]']
ensemble_2_conv2d_21 (Conv2D)	(None, 128, 128, 32)	9248	['ensemble_2_max_pooling2d_20[0][0]']
ensemble_2_activation_38 (Activation)	(None, 128, 128, 32)	0	['ensemble_2_conv2d_21[0][0]']
ensemble_2_batch_normalization_33 (BatchNormalization)	(None, 128, 128, 32)	128	['ensemble_2_activation_38[0][0]']
ensemble_2_max_pooling2d_21 (MaxPooling2D)	(None, 64, 64, 32)	0	['ensemble_2_batch_normalization_33[0][0]']
ensemble_2_conv2d_22 (Conv2D)	(None, 64, 64, 64)	18496	['ensemble_2_max_pooling2d_21[0][0]']
ensemble_4_cnn_input (InputLayer)	(None, 256, 256, 1)	0	[]
ensemble_1_cnn_input (InputLayer)	(None, 256, 256, 1)	0	[]
ensemble_2_activation_39 (Activation)	(None, 64, 64, 64)	0	['ensemble_2_conv2d_22[0][0]']
ensemble_4_conv2d (Conv2D)	(None, 256, 256, 16)	160	['ensemble_4_cnn_input[0][0]']
ensemble_1_conv2d_3 (Conv2D)	(None, 256, 256, 32)	320	['ensemble_1_cnn_input[0][0]']
ensemble_2_batch_normalization_34 (BatchNormalization)	(None, 64, 64, 64)	256	['ensemble_2_activation_39[0][0]']
ensemble_4_activation (Activation)	(None, 256, 256, 16)	0	['ensemble_4_conv2d[0][0]']
ensemble_1_activation_6 (Activation)	(None, 256, 256, 32)	0	['ensemble_1_conv2d_3[0][0]']
ensemble_2_max_pooling2d_22 (MaxPooling2D)	(None, 32, 32, 64)	0	['ensemble_2_batch_normalization_34[0][0]']
ensemble_4_batch_normalization (BatchNormalization)	(None, 256, 256, 16)	64	['ensemble_4_activation[0][0]']
ensemble_1_batch_normalization_5 (BatchNormalization)	(None, 256, 256, 32)	128	['ensemble_1_activation_6[0][0]']
ensemble_2_conv2d_23 (Conv2D)	(None, 32, 32, 64)	36928	['ensemble_2_max_pooling2d_22[0][0]']
ensemble_4_max_pooling2d (MaxPooling2D)	(None, 128, 128, 16)	0	['ensemble_4_batch_normalization[0][0]']

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ensemble_1_max_pooling2d_3 (MaxPooling2D)	(None, 128, 128, 32 0)	['ensemble_1_batch_normalization_5[0][0]']
ensemble_2_activation_40 (Activation)	(None, 32, 32, 64) 0	['ensemble_2_conv2d_23[0][0]']
ensemble_4_conv2d_1 (Conv2D)	(None, 128, 128, 32 4640)	['ensemble_4_max_pooling2d[0][0]']
ensemble_1_conv2d_4 (Conv2D)	(None, 128, 128, 64 18496)	['ensemble_1_max_pooling2d_3[0][0]']
ensemble_2_batch_normalization_35 (BatchNormalization)	(None, 32, 32, 64) 256	['ensemble_2_activation_40[0][0]']
ensemble_3_cnn_input (InputLayer)	[(None, 256, 256, 1 0)]	[]
ensemble_4_activation_1 (Activation)	(None, 128, 128, 32 0)	['ensemble_4_conv2d_1[0][0]']
ensemble_1_activation_7 (Activation)	(None, 128, 128, 64 0)	['ensemble_1_conv2d_4[0][0]']
ensemble_2_max_pooling2d_23 (MaxPooling2D)	(None, 16, 16, 64) 0	['ensemble_2_batch_normalization_35[0][0]']
ensemble_3_conv2d_15 (Conv2D)	(None, 256, 256, 32 320)	['ensemble_3_cnn_input[0][0]']
ensemble_4_batch_normalization_1 (BatchNormalization)	(None, 128, 128, 32 128)	['ensemble_4_activation_1[0][0]']
ensemble_1_batch_normalization_6 (BatchNormalization)	(None, 128, 128, 64 256)	['ensemble_1_activation_7[0][0]']
ensemble_2_flatten_5 (Flatten)	(None, 16384) 0	['ensemble_2_max_pooling2d_23[0][0]']
ensemble_3_activation_25 (Activation)	(None, 256, 256, 32 0)	['ensemble_3_conv2d_15[0][0]']
ensemble_4_max_pooling2d_1 (MaxPooling2D)	(None, 64, 64, 32) 0	['ensemble_4_batch_normalization_1[0][0]']
ensemble_1_max_pooling2d_4 (MaxPooling2D)	(None, 64, 64, 64) 0	['ensemble_1_batch_normalization_6[0][0]']
ensemble_2_dense_54 (Dense)	(None, 128) 2097280	['ensemble_2_flatten_5[0][0]']
ensemble_3_batch_normalization_25 (BatchNormalization)	(None, 256, 256, 32 128)	['ensemble_3_activation_25[0][0]']
ensemble_4_conv2d_2 (Conv2D)	(None, 64, 64, 64) 18496	['ensemble_4_max_pooling2d_1[0][0]']
ensemble_1_conv2d_5 (Conv2D)	(None, 64, 64, 128) 73856	['ensemble_1_max_pooling2d_4[0][0]']
ensemble_2_activation_41 (Activation)	(None, 128) 0	['ensemble_2_dense_54[0][0]']
ensemble_3_max_pooling2d_15 (MaxPooling2D)	(None, 128, 128, 32 0)	['ensemble_3_batch_normalization_25[0][0]']
ensemble_4_activation_2 (Activation)	(None, 64, 64, 64) 0	['ensemble_4_conv2d_2[0][0]']
ensemble_1_activation_8 (Activation)	(None, 64, 64, 128) 0	['ensemble_1_conv2d_5[0][0]']

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ensemble_2_batch_normalization_36 (BatchNormalization)	(None, 128)	512	['ensemble_2_activation_41[0][0]']
ensemble_3_conv2d_16 (Conv2D)	(None, 128, 128, 64)	18496	['ensemble_3_max_pooling2d_15[0][0]']
ensemble_4_batch_normalization_2 (BatchNormalization)	(None, 64, 64, 64)	256	['ensemble_4_activation_2[0][0]']
ensemble_1_batch_normalization_7 (BatchNormalization)	(None, 64, 64, 128)	512	['ensemble_1_activation_8[0][0]']
ensemble_2_dropout_12 (Dropout)	(None, 128)	0	['ensemble_2_batch_normalization_36[0][0]']
ensemble_3_activation_26 (Activation)	(None, 128, 128, 64)	0	['ensemble_3_conv2d_16[0][0]']
ensemble_4_max_pooling2d_2 (MaxPooling2D)	(None, 32, 32, 64)	0	['ensemble_4_batch_normalization_2[0][0]']
ensemble_1_max_pooling2d_5 (MaxPooling2D)	(None, 32, 32, 128)	0	['ensemble_1_batch_normalization_7[0][0]']
ensemble_2_dense_55 (Dense)	(None, 64)	8256	['ensemble_2_dropout_12[0][0]']
ensemble_3_batch_normalization_26 (BatchNormalization)	(None, 128, 128, 64)	256	['ensemble_3_activation_26[0][0]']
ensemble_4_conv2d_3 (Conv2D)	(None, 32, 32, 128)	73856	['ensemble_4_max_pooling2d_2[0][0]']
ensemble_1_flatten_1 (Flatten)	(None, 131072)	0	['ensemble_1_max_pooling2d_5[0][0]']
ensemble_2_activation_42 (Activation)	(None, 64)	0	['ensemble_2_dense_55[0][0]']
ensemble_3_max_pooling2d_16 (MaxPooling2D)	(None, 64, 64, 64)	0	['ensemble_3_batch_normalization_26[0][0]']
ensemble_4_activation_3 (Activation)	(None, 32, 32, 128)	0	['ensemble_4_conv2d_3[0][0]']
ensemble_1_dense_10 (Dense)	(None, 64)	8388672	['ensemble_1_flatten_1[0][0]']
ensemble_2_batch_normalization_37 (BatchNormalization)	(None, 64)	256	['ensemble_2_activation_42[0][0]']
ensemble_3_conv2d_17 (Conv2D)	(None, 64, 64, 128)	73856	['ensemble_3_max_pooling2d_16[0][0]']
ensemble_4_batch_normalization_3 (BatchNormalization)	(None, 32, 32, 128)	512	['ensemble_4_activation_3[0][0]']
ensemble_1_activation_9 (Activation)	(None, 64)	0	['ensemble_1_dense_10[0][0]']
ensemble_2_dropout_13 (Dropout)	(None, 64)	0	['ensemble_2_batch_normalization_37[0][0]']
ensemble_3_activation_27 (Activation)	(None, 64, 64, 128)	0	['ensemble_3_conv2d_17[0][0]']
ensemble_4_max_pooling2d_3 (MaxPooling2D)	(None, 16, 16, 128)	0	['ensemble_4_batch_normalization_3[0][0]']
ensemble_1_batch_normalization_8 (BatchNormalization)	(None, 64)	256	['ensemble_1_activation_9[0][0]']

ensemble_2_dense_56 (Dense)	(None, 32)	2080	['ensemble_2_dropout_13[0][0]']
ensemble_3_batch_normalization_27 (BatchNormalization)	(None, 64, 64, 128)	512	['ensemble_3_activation_27[0][0]']
ensemble_4_flatten (Flatten)	(None, 32768)	0	['ensemble_4_max_pooling2d_3[0][0]']
ensemble_1_dropout_2 (Dropout)	(None, 64)	0	['ensemble_1_batch_normalization_8[0][0]']
ensemble_2_activation_43 (Activation)	(None, 32)	0	['ensemble_2_dense_56[0][0]']
ensemble_3_max_pooling2d_17 (MaxPooling2D)	(None, 32, 32, 128)	0	['ensemble_3_batch_normalization_27[0][0]']
ensemble_4_dense_1 (Dense)	(None, 32)	1048608	['ensemble_4_flatten[0][0]']
ensemble_1_dense_11 (Dense)	(None, 16)	1040	['ensemble_1_dropout_2[0][0]']
ensemble_2_batch_normalization_38 (BatchNormalization)	(None, 32)	128	['ensemble_2_activation_43[0][0]']
ensemble_3_flatten_5 (Flatten)	(None, 131072)	0	['ensemble_3_max_pooling2d_17[0][0]']
ensemble_4_activation_4 (Activation)	(None, 32)	0	['ensemble_4_dense_1[0][0]']
ensemble_1_activation_10 (Activation)	(None, 16)	0	['ensemble_1_dense_11[0][0]']
ensemble_2_dropout_14 (Dropout)	(None, 32)	0	['ensemble_2_batch_normalization_38[0][0]']
ensemble_3_dense_30 (Dense)	(None, 32)	4194336	['ensemble_3_flatten_5[0][0]']
ensemble_4_batch_normalization_4 (BatchNormalization)	(None, 32)	128	['ensemble_4_activation_4[0][0]']
ensemble_1_batch_normalization_9 (BatchNormalization)	(None, 16)	64	['ensemble_1_activation_10[0][0]']
ensemble_2_dense_57 (Dense)	(None, 16)	528	['ensemble_2_dropout_14[0][0]']
ensemble_3_activation_28 (Activation)	(None, 32)	0	['ensemble_3_dense_30[0][0]']
ensemble_4_dropout (Dropout)	(None, 32)	0	['ensemble_4_batch_normalization_4[0][0]']
ensemble_1_mlp_input (InputLayer)	[(None, 4)]	0	[]
ensemble_1_dropout_3 (Dropout)	(None, 16)	0	['ensemble_1_batch_normalization_9[0][0]']
ensemble_2_activation_44 (Activation)	(None, 16)	0	['ensemble_2_dense_57[0][0]']
ensemble_3_batch_normalization_28 (BatchNormalization)	(None, 32)	128	['ensemble_3_activation_28[0][0]']
ensemble_4_dense_2 (Dense)	(None, 8)	264	['ensemble_4_dropout[0][0]']
ensemble_1_dense_8 (Dense)	(None, 8)	40	['ensemble_1_mlp_input[0][0]']
ensemble_1_dense_12 (Dense)	(None, 4)	68	['ensemble_1_dropout_3[0][0]']

ensemble_2_batch_normalization_39 (BatchNormalization)	(None, 16)	64	['ensemble_2_activation_44[0][0]']
ensemble_3_dropout_10 (Dropout)	(None, 32)	0	['ensemble_3_batch_normalization_28[0][0]']
ensemble_4_activation_5 (Activation)	(None, 8)	0	['ensemble_4_dense_2[0][0]']
ensemble_1_dense_9 (Dense)	(None, 4)	36	['ensemble_1_dense_8[0][0]']
ensemble_1_activation_11 (Activation)	(None, 4)	0	['ensemble_1_dense_12[0][0]']
ensemble_2_mlp_input (InputLayer)	[(None, 4)]	0	[]
ensemble_2_dropout_15 (Dropout)	(None, 16)	0	['ensemble_2_batch_normalization_39[0][0]']
ensemble_3_dense_31 (Dense)	(None, 8)	264	['ensemble_3_dropout_10[0][0]']
ensemble_4_batch_normalization_5 (BatchNormalization)	(None, 8)	32	['ensemble_4_activation_5[0][0]']
ensemble_1_concatenate_1 (Concatenate)	(None, 8)	0	['ensemble_1_dense_9[0][0]', 'ensemble_1_activation_11[0][0]']
ensemble_2_dense_52 (Dense)	(None, 8)	40	['ensemble_2_mlp_input[0][0]']
ensemble_2_dense_58 (Dense)	(None, 4)	68	['ensemble_2_dropout_15[0][0]']
ensemble_3_activation_29 (Activation)	(None, 8)	0	['ensemble_3_dense_31[0][0]']
ensemble_4_dropout_1 (Dropout)	(None, 8)	0	['ensemble_4_batch_normalization_5[0][0]']
ensemble_1_dense_13 (Dense)	(None, 32)	288	['ensemble_1_concatenate_1[0][0]']
ensemble_2_dense_53 (Dense)	(None, 4)	36	['ensemble_2_dense_52[0][0]']
ensemble_2_activation_45 (Activation)	(None, 4)	0	['ensemble_2_dense_58[0][0]']
ensemble_3_mlp_input (InputLayer)	[(None, 4)]	0	[]
ensemble_3_batch_normalization_29 (BatchNormalization)	(None, 8)	32	['ensemble_3_activation_29[0][0]']
ensemble_4_mlp_input (InputLayer)	[(None, 4)]	0	[]
ensemble_4_dense_3 (Dense)	(None, 4)	36	['ensemble_4_dropout_1[0][0]']
ensemble_1_dense_14 (Dense)	(None, 64)	2112	['ensemble_1_dense_13[0][0]']
ensemble_2_concatenate_5 (Concatenate)	(None, 8)	0	['ensemble_2_dense_53[0][0]', 'ensemble_2_activation_45[0][0]']
ensemble_3_dense_29 (Dense)	(None, 8)	40	['ensemble_3_mlp_input[0][0]']
ensemble_3_dropout_11 (Dropout)	(None, 8)	0	['ensemble_3_batch_normalization_29[0][0]']
ensemble_4_dense (Dense)	(None, 15)	75	['ensemble_4_mlp_input[0][0]']

ensemble_4_activation_6 (Activation)	(None, 4)	0	['ensemble_4_dense_3[0][0]']
ensemble_1_dense_15 (Dense)	(None, 128)	8320	['ensemble_1_dense_14[0][0]']
ensemble_2_dense_59 (Dense)	(None, 128)	1152	['ensemble_2_concatenate_5[0][0]']
ensemble_3_concatenate_5 (Concatenate)	(None, 16)	0	['ensemble_3_dense_29[0][0]', 'ensemble_3_dropout_11[0][0]']
ensemble_4_concatenate (Concatenate)	(None, 19)	0	['ensemble_4_dense[0][0]', 'ensemble_4_activation_6[0][0]']
ensemble_1_dense_16 (Dense)	(None, 64)	8256	['ensemble_1_dense_15[0][0]']
ensemble_2_dense_60 (Dense)	(None, 64)	8256	['ensemble_2_dense_59[0][0]']
ensemble_3_dense_32 (Dense)	(None, 64)	1088	['ensemble_3_concatenate_5[0][0]']
ensemble_4_dense_4 (Dense)	(None, 32)	640	['ensemble_4_concatenate[0][0]']
ensemble_1_dense_17 (Dense)	(None, 32)	2080	['ensemble_1_dense_16[0][0]']
ensemble_2_dense_61 (Dense)	(None, 32)	2080	['ensemble_2_dense_60[0][0]']
ensemble_3_dense_33 (Dense)	(None, 32)	2080	['ensemble_3_dense_32[0][0]']
ensemble_4_dense_5 (Dense)	(None, 32)	1056	['ensemble_4_dense_4[0][0]']
ensemble_1_class_output (Dense)	(None, 15)	495	['ensemble_1_dense_17[0][0]']
ensemble_2_class_output (Dense)	(None, 15)	495	['ensemble_2_dense_61[0][0]']
ensemble_3_class_output (Dense)	(None, 15)	495	['ensemble_3_dense_33[0][0]']
ensemble_4_class_output (Dense)	(None, 15)	495	['ensemble_4_dense_5[0][0]']
concatenate_13 (Concatenate)	(None, 60)	0	['ensemble_1_class_output[0][0]', 'ensemble_2_class_output[0][0]', 'ensemble_3_class_output[0][0]', 'ensemble_4_class_output[0][0]']
dense_13 (Dense)	(None, 60)	3660	['concatenate_13[0][0]']
class_output (Dense)	(None, 15)	915	['dense_13[0][0]']

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Total params: 16,138,338
Trainable params: 4,575
Non-trainable params: 16,133,763

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