DenseNet121 Optimum Hiperparametre Ayarları

Hyperparameter Name	Parameters
Activation Function	**ReLU**, Leaky ReLU, GeLU, Tanh, Swiss
Dense Layer Neuron Sayısı	256, 512, **1024**, 2048
Optimizer	Adam, Nadam, AdamW, RMSprop, SDG
Learning Rate	0.0001
Batch Size	8, 16, 32, 64, 128
Epoch	10, 20, 30, 40

Tablo 1. DenseNet121 ve Hibrit Modellerin Performans Değerlendirme Sonuçları

Models	A	P	R	S	F0	F1	F2	Kappa	MCC
DenseNet121	0.6753	0.6464	0.6753	0.8918	0.6451	0.6510	0.6637	0.5671	0.5747
DenseNet121 + SVM	0.6465	0.6284	0.6465	0.8822	0.6296	0.6336	0.6403	0.5286	0.5313
DenseNet121 + SVM (linear)	0.6465	0.6284	0.6465	0.8822	0.6296	0.6336	0.6403	0.5286	0.5313
DenseNet121 + SVM (poly)	0.6338	0.6137	0.6338	0.8779	0.6165	0.6218	0.6285	0.5117	0.5132
DenseNet121 + SVM (sigmoid)	0.4951	0.5294	0.4951	0.8317	0.5114	0.4956	0.4914	0.3268	0.3344
DenseNet121 + AdaBoost	0.5288	0.5432	0.5288	0.8429	0.5380	0.5325	0.5294	0.3717	0.3731
DenseNet121 + LightGBM	0.6611	0.6429	0.6611	0.8870	0.6447	0.6492	0.6557	0.5482	0.5503
DenseNet121 + XGBoost	0.6299	0.6141	0.6299	0.8766	0.6160	0.6199	0.6254	0.5065	0.5079
DenseNet121 + CatBoost	0.6152	0.5875	0.6152	0.8717	0.5909	0.5981	0.6077	0.4870	0.4895
DenseNet121 + GBM	0.6299	0.6141	0.6299	0.8766	0.6160	0.6199	0.6254	0.5065	0.5079

Tablo 2. DenseNet121 ve Hibrit Modellerin ROC AUC Sonuçları

Models	ROC AUC
DenseNet121	
DenseNet121 + SVM	
DenseNet121 + SVM (linear)	
DenseNet121 + SVM (poly)	
DenseNet121 + SVM (sigmoid)	
DenseNet121 + AdaBoost	
DenseNet121 + LightGBM	
DenseNet121 + XGBoost	
DenseNet121 + CatBoost	
DenseNet121 + GBM	

Tablo 3. DenseNet121 ve Hibrit Modellerin Alt Sınıflandırma Sonuçları

DenseNet

Class Names	A	P	R	S	F0	F1	F2	Kappa	MCC
No Impairment									

Mild Impairment									
Moderate Impairment									
Very Mild Impairment									

DenseNet + En iyi Hibrit

Class Names	**A**	**P**	**R**	**S**	**F0**	**F1**	**F2**	**Kappa**	**MCC**
No Impairment									
Mild Impairment									
Moderate Impairment									
Very Mild Impairment									

DENSENET121 MODELİNİN EĞİTİM GRAFİĞİ VE LOSS GRAFİĞİ KOYULACAK

EN İYİ SONUCU VEREN MODELİN ROC GRAFİĞİ KOYULACAK

EN İYİ SONUCU VEREN MODELİN PRECISION-RECALL GRAFİĞİ KOYULACAK

DENSENET121 Modelinin Confusion Matrisi

DENSENET121 En iyi hibrit Modelinin Confusion Matrisi

DenseNet121 Optimum Hiperparametre Ayarları

Hyperparameter Name	Parameters
Activation Function	**ReLU**, Leaky ReLU, GeLU, Tanh, Swiss
Dense Layer Neuron Sayısı	256, 512, **1024**, 2048
Optimizer	Adam, Nadam, AdamW, RMSprop, SDG
Learning Rate	0.0001
Batch Size	8, 16, 32, 64, 128
Epoch	10, 20, 30, 40

Tablo 4. DenseNet169 ve Hibrit Modellerin Performans Değerlendirme Sonuçları

Models	A	P	R	S	F0	F1	F2	Kappa	MCC
DenseNet169	0.6743	0.6627	0.6743	0.8914	0.6643	0.6673	0.6712	0.5658	0.5665
DenseNet169 + SVM (linear)	0.6514	0.6328	0.6514	0.8838	0.6334	0.6371	0.6444	0.5352	0.5386
DenseNet169 + SVM (rbf)	0.6328	0.6149	0.6328	0.8776	0.6172	0.6218	0.6279	0.5104	0.5118
DenseNet169 + SVM (poly)	0.6455	0.6297	0.6455	0.8818	0.6316	0.6356	0.6410	0.5273	0.5286
DenseNet169 + SVM (sigmoid)	0.4751	0.4497	0.4751	0.8250	0.4513	0.4569	0.4664	0.3001	0.3028
DenseNet169 + Gradient Boosting	0.6499	0.6349	0.6499	0.8833	0.6367	0.6405	0.6456	0.5332	0.5345
DenseNet169 + LightGBM	0.6641	0.6457	0.6641	0.8880	0.6475	0.6520	0.6585	0.5521	0.5541
DenseNet169 + CatBoost	0.6211	0.5996	0.6211	0.8737	0.6023	0.6077	0.6151	0.4948	0.4966
DenseNet169 + AdaBoost	0.5376	0.5608	0.5376	0.8459	0.5519	0.5425	0.5380	0.3835	0.3862

Tablo 5. DenseNet169 ve Hibrit Modellerin ROC AUC Sonuçları

Models	ROC AUC
DenseNet169	
DenseNet169 + SVM	

DenseNet169 + SVM (linear)	
DenseNet169 + SVM (poly)	
DenseNet169 + SVM (sigmoid)	
DenseNet169 + AdaBoost	
DenseNet169 + LightGBM	
DenseNet169 + XGBoost	
DenseNet169 + CatBoost	
DenseNet169 + GBM	

Tablo 6. DenseNet121 ve Hibrit Modellerin Alt Sınıflandırma Sonuçları

DenseNet

Class Names	A	P	R	S	F0	F1	F2	Kappa	MCC
No Impairment									
Mild Impairment									
Moderate Impairment									
Very Mild Impairment									

DenseNet + En iyi Hibrit

Class Names	A	P	R	S	F0	F1	F2	Kappa	MCC
No Impairment									
Mild Impairment									
Moderate Impairment									
Very Mild Impairment									

DENSENET169 MODELİNİN EĞİTİM GRAFİĞİ VE LOSS GRAFİĞİ KOYULACAK

EN İYİ SONUCU VEREN MODELİN ROC GRAFİĞİ KOYULACAK

EN İYİ SONUCU VEREN MODELİN PRECISION-RECALL GRAFİĞİ KOYULACAK

DenseNet201 Optimum Hiperparametre Ayarları

Hyperparameter Name	Parameters
Activation Function	**ReLU**, Leaky ReLU, GeLU, Tanh, Swiss
Dense Layer Neuron Sayısı	256, 512, **1024**, 2048
Optimizer	Adam, Nadam, AdamW, RMSprop, SDG
Learning Rate	0.0001
Batch Size	8, 16, 32, 64, 128
Epoch	10, 20, 30, 40

Tablo 7. DenseNet201 ve Hibrit Modellerin Performans Değerlendirme Sonuçları

Models	A	P	R	S	F0	F1	F2	Kappa	MCC
DenseNet201	0.6919	0.6753	0.6919	0.8973	0.6771	0.6813	0.6871	0.5892	0.5909
DenseNet201 + SVM (linear)	0.6548	0.6333	0.6548	0.8849	0.6344	0.6391	0.6473	0.5397	0.5432
DenseNet201 + SVM (rbf)	0.6411	0.6238	0.6411	0.8804	0.6262	0.6308	0.6366	0.5215	0.5227
DenseNet201 + SVM (poly)	0.6636	0.6474	0.6636	0.8879	0.6494	0.6536	0.6591	0.5514	0.5527
DenseNet201 + SVM (sigmoid)	0.4199	0.4024	0.4199	0.8066	0.3950	0.3944	0.4052	0.2266	0.2335
DenseNet201 + Gradient Boosting	0.6680	0.6502	0.6680	0.8893	0.6517	0.6558	0.6622	0.5573	0.5595
DenseNet201 + LightGBM	0.6831	0.6640	0.6831	0.8944	0.6651	0.6694	0.6766	0.5775	0.5804
DenseNet201 + CatBoost	0.6494	0.6273	0.6494	0.8831	0.6294	0.6349	0.6428	0.5326	0.5351
DenseNet201 + AdaBoost	0.5649	0.5714	0.5649	0.8550	0.5671	0.5633	0.5630	0.4199	0.4225

Tablo 8. DenseNet201 ve Hibrit Modellerin ROC AUC Sonuçları

Models	ROC AUC
DenseNet201	
DenseNet201+ SVM	
DenseNet201+ SVM (linear)	
DenseNet201+ SVM (poly)	
DenseNet201+ SVM (sigmoid)	
DenseNet201+ AdaBoost	
DenseNet201+ LightGBM	
DenseNet201+ XGBoost	
DenseNet201+ CatBoost	
DenseNet201+ GBM	

Tablo 9. DenseNet201 ve Hibrit Modellerin Alt Sınıflandırma Sonuçları

DenseNet

Class Names	A	P	R	S	F0	F1	F2	Kappa	MCC
No Impairment									
Mild Impairment									
Moderate Impairment									
Very Mild Impairment									

DenseNet + En iyi Hibrit

Class Names	A	P	R	S	F0	F1	F2	Kappa	MCC
No Impairment									
Mild Impairment									
Moderate Impairment									
Very Mild Impairment									

DENSENET169 MODELİNİN EĞİTİM GRAFİĞİ VE LOSS GRAFİĞİ KOYULACAK

EN İYİ SONUCU VEREN MODELİN ROC GRAFİĞİ KOYULACAK

EN İYİ SONUCU VEREN MODELİN PRECISION-RECALL GRAFİĞİ KOYULACAK