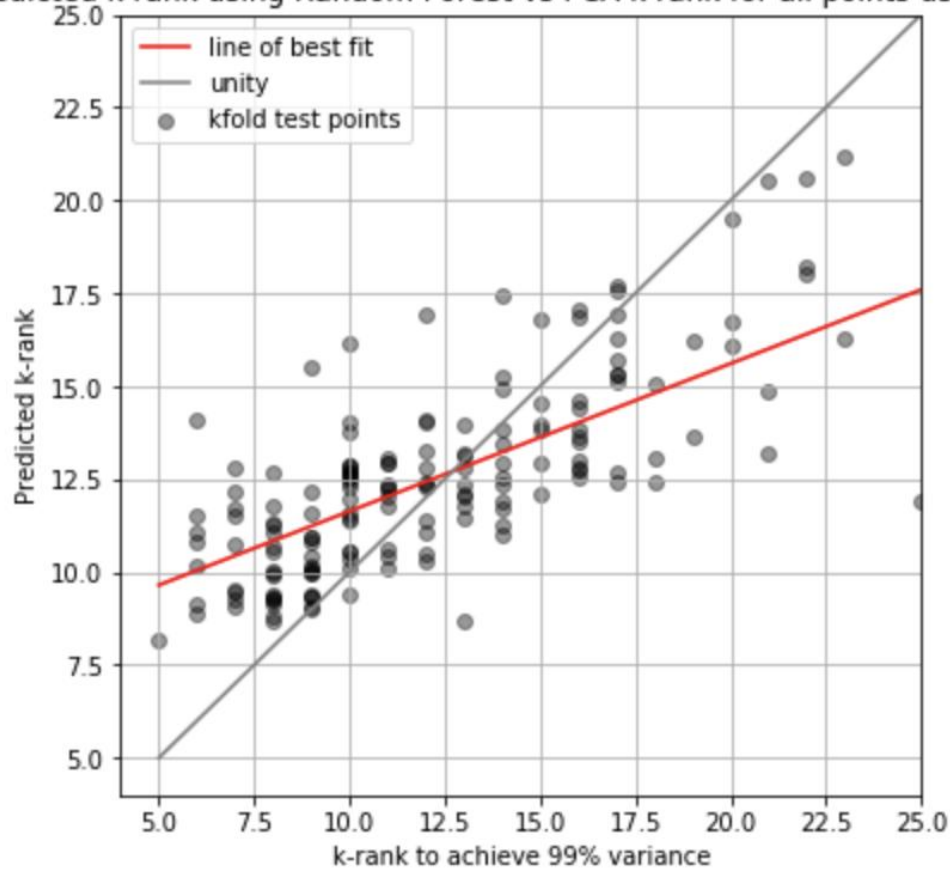


Feature importance for RandomForest including all features:

```
{'binned_complexity': 0.12,  
'horizontal_complexity': 0.08,  
'length_soma': 0.03,  
'avg_length_dendrite': 0.03,  
'avg_length_axon': 0.01,  
'total_length_dendrite': 0.03,  
'total_length_axon': 0.01,  
'length_dendrite_var': 0.03,  
'length_axon_var': 0.01,  
'count_axon': 0.01,  
'count_dendrite': 0.0,  
'avg_diameter_dendrite': 0.01,  
'avg_diameter_axon': 0.03,  
'var_diameter_dendrite': 0.03,  
'var_diameter_axon': 0.0,  
'm_type': 0.23,  
'e_type': 0.34,  
'level': 0.0}
```

Predicted k rank using Random Forest vs PCA k rank for all points using Kfold

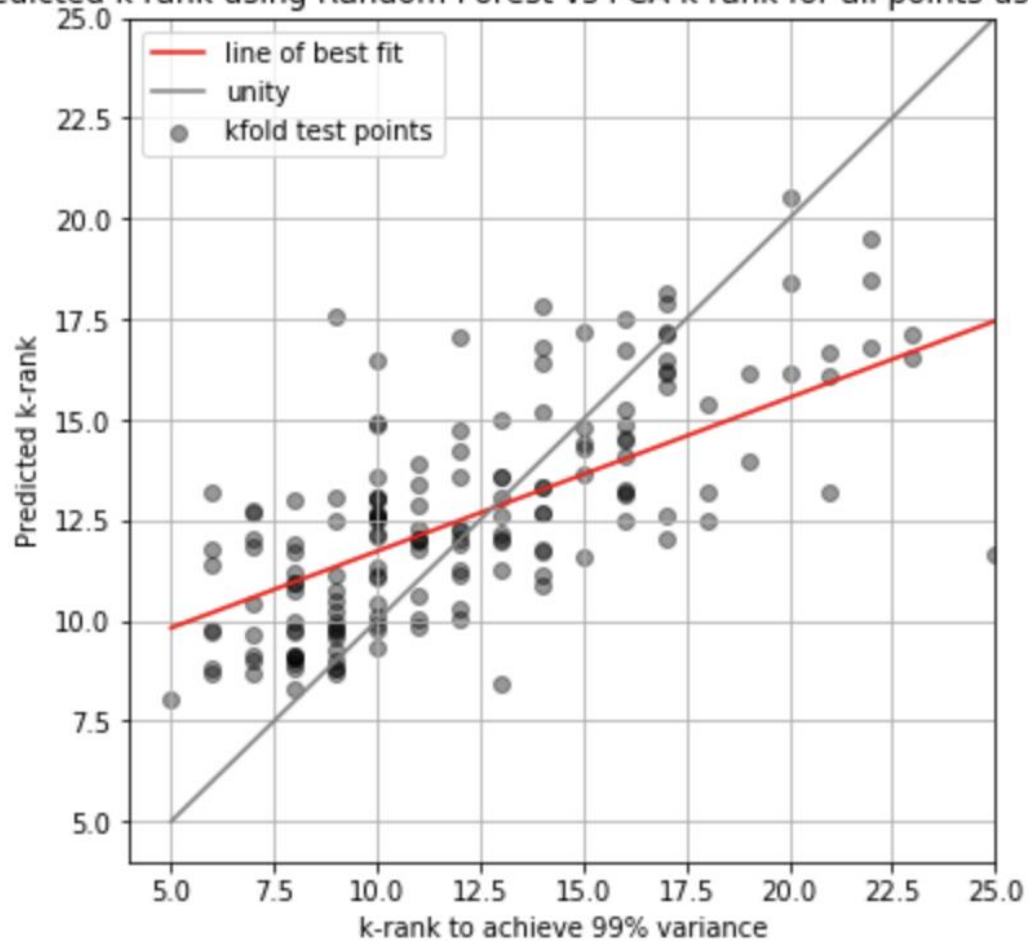


$R^2 = 0.52$

Feature importance for RandomForest removing m_type and layers:

```
{'binned_complexity': 0.16,  
'horizontal_complexity': 0.12,  
'length_soma': 0.04,  
'avg_length_dendrite': 0.03,  
'avg_length_axon': 0.01,  
'total_length_dendrite': 0.03,  
'total_length_axon': 0.01,  
'length_dendrite_var': 0.03,  
'length_axon_var': 0.01,  
'count_axon': 0.01,  
'count_dendrite': 0.01,  
'avg_diameter_dendrite': 0.01,  
'avg_diameter_axon': 0.04,  
'var_diameter_dendrite': 0.03,  
'var_diameter_axon': 0.01,  
'e_type': 0.45}
```

Predicted k rank using Random Forest vs PCA k rank for all points using Kfold

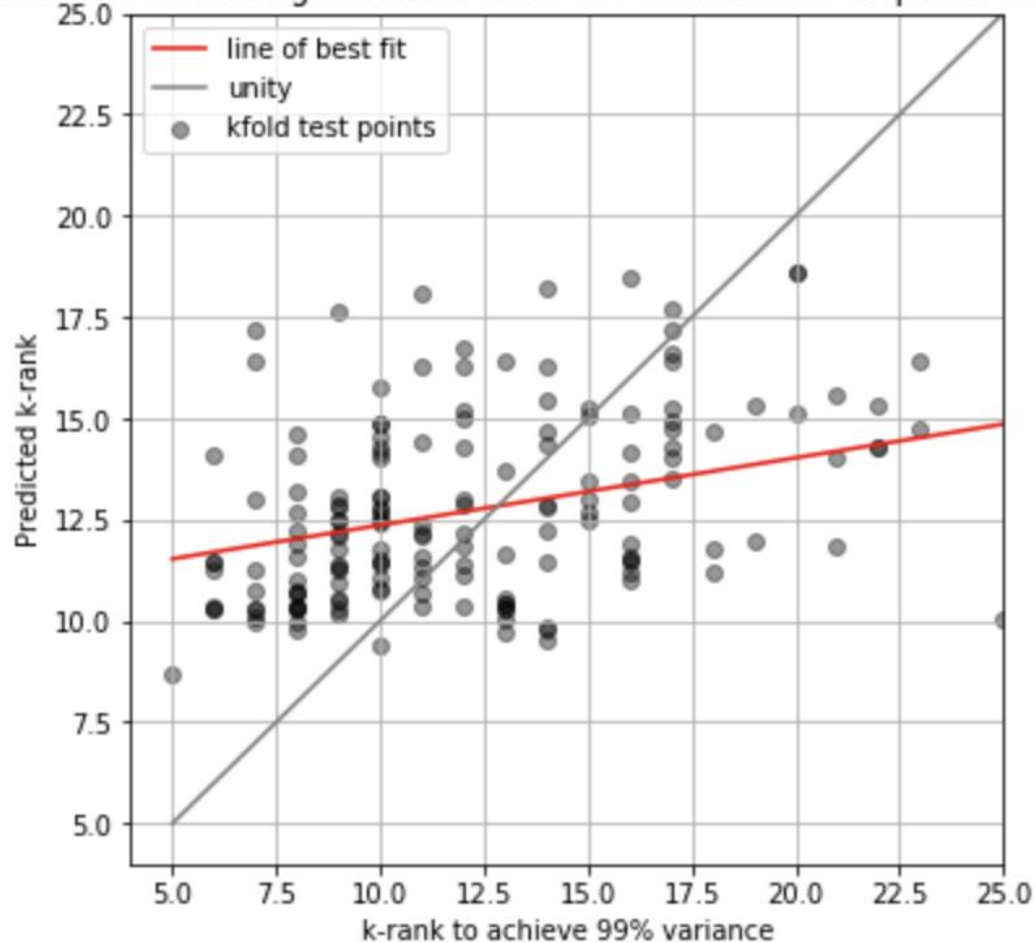


$R^2 = 0.485$

Feature importance for RandomForest removing m_type and e_type and layers:

```
{'binned_complexity': 0.32,  
'horizontal_complexity': 0.29,  
'length_soma': 0.06,  
'avg_length_dendrite': 0.04,  
'avg_length_axon': 0.02,  
'total_length_dendrite': 0.05,  
'total_length_axon': 0.02,  
'length_dendrite_var': 0.05,  
'length_axon_var': 0.02,  
'count_axon': 0.02,  
'count_dendrite': 0.01,  
'avg_diameter_dendrite': 0.01,  
'avg_diameter_axon': 0.06,  
'var_diameter_dendrite': 0.05,  
'var_diameter_axon': 0.01}
```

Predicted k rank using Random Forest vs PCA k rank for all points using Kfold

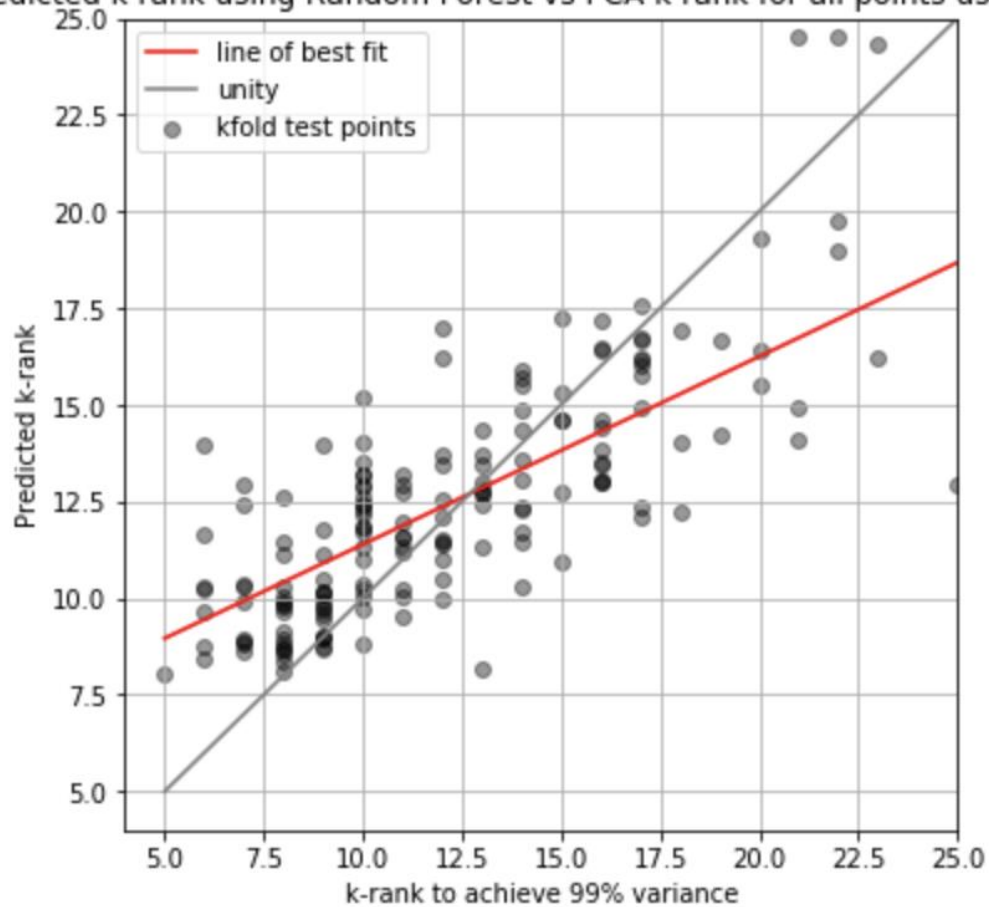


R2 = 0.15

Choosing only feature provided by Lasso

```
{'binned_complexity': 0.13,  
'length_soma': 0.03,  
'avg_length_dendrite': 0.04,  
'avg_length_axon': 0.01,  
'total_length_dendrite': 0.05,  
'length_axon_var': 0.01,  
'avg_diameter_axon': 0.03,  
'var_diameter_axon': 0.0,  
'm_type': 0.26,  
'e_type': 0.43,}
```

Predicted k rank using Random Forest vs PCA k rank for all points using Kfold



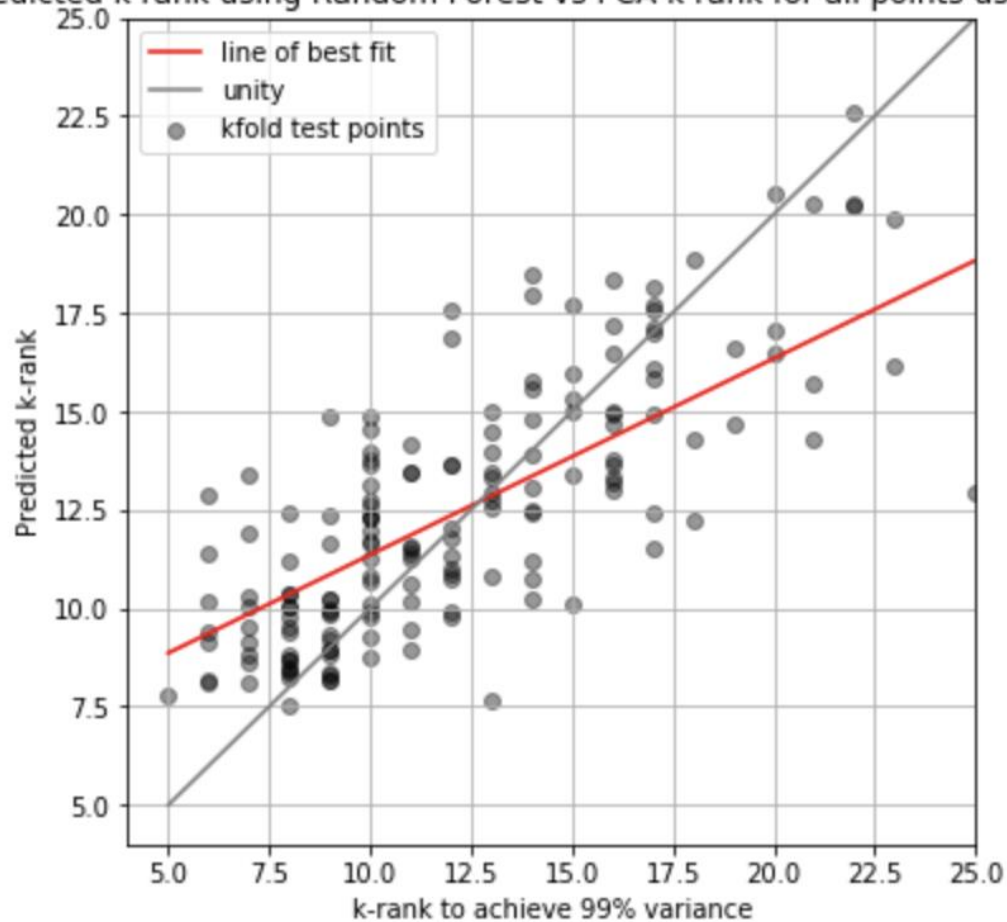
R²= 0.598

Removing M-type from Lasso features

Feature importance

```
{'binned_complexity': 0.19,  
 'length_soma': 0.04,  
 'avg_length_dendrite': 0.04,  
 'avg_length_axon': 0.01,  
 'total_length_dendrite': 0.05,  
 'length_axon_var': 0.01,  
 'avg_diameter_axon': 0.05,  
 'var_diameter_axon': 0.01,  
 'e_type': 0.61}
```

Predicted k rank using Random Forest vs PCA k rank for all points using Kfold



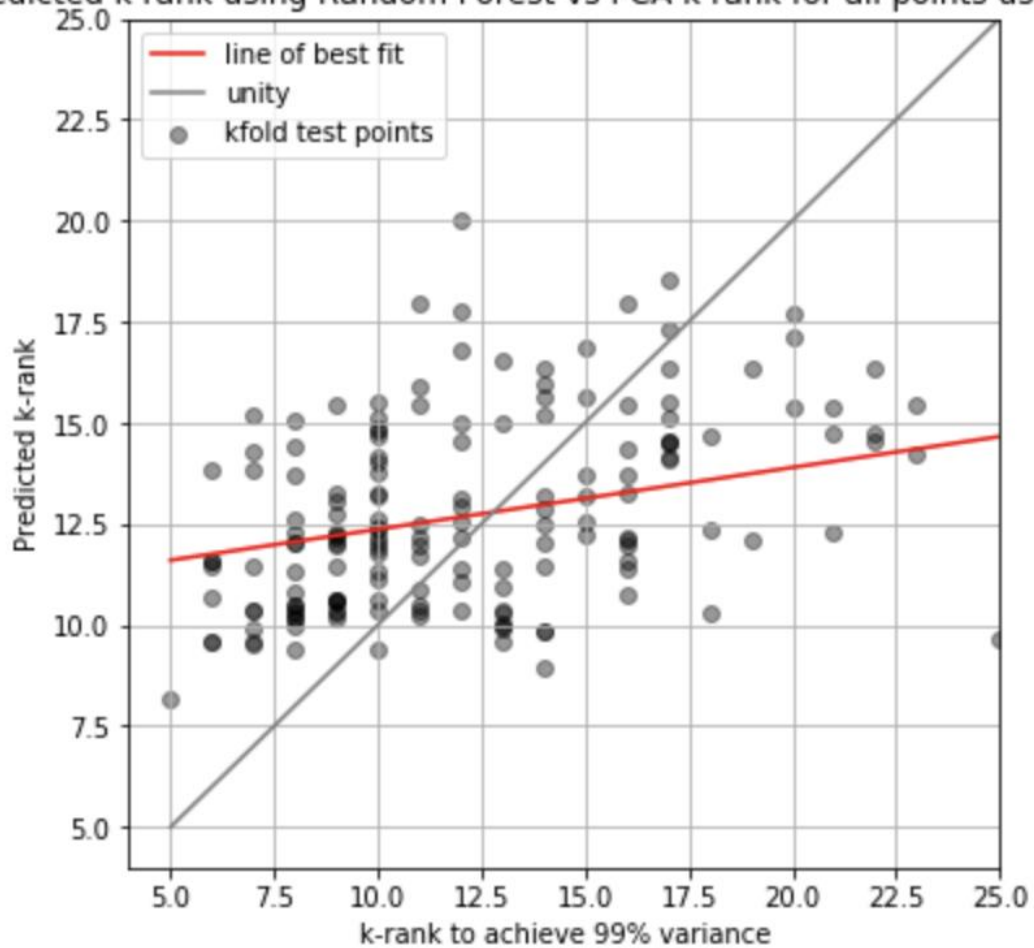
R²= 0.593

Removing M-type and E-type from Lasso features

Feature importance

```
{'binned_complexity': 0.58,  
 'length_soma': 0.1,  
 'avg_length_dendrite': 0.07,  
 'avg_length_axon': 0.02,  
 'total_length_dendrite': 0.08,  
 'length_axon_var': 0.02,  
 'avg_diameter_axon': 0.1,  
 'var_diameter_axon': 0.01}
```

Predicted k rank using Random Forest vs PCA k rank for all points using Kfold



$R^2 = 0.12$