Select Rows — Thu Jul 26 18, 13:58:57

Data

Data instances: 1294
Features: 69
Meta attributes: 2
Condition: Curie Temp is defined

Matching data

Data instances: 94
Features: 54
Meta attributes: 2

Non-matching data

Data instances: 1200
Features: 68
Meta attributes: 2

Select Columns — Thu Jul 26 18, 13:59:16

Input data

Features: Total SiCAl, Total BP, Total GaGe, Total Late Transition, Total Early Transition, Relative to Fe SiCAl, Relative to Fe BP, Relative to Fe GaGe, Relative to Fe Early, Relative to Fe Late, Relative to Late Early, Relative to Early SiCAl, Relative to Late SiCAl, Relative to Early BP, Relative to Late BP, Late Weighted Volume, Late Weighted Area, Late Weighted Mass, Late Mean Electrons, Early Weighted Volume, Early Weighted Area, Early Weighted Mass, Early Mean Electrons, Delta T0, Delta T1, Delta T2, Fe, Si, C, Al, B, P, Ga, Cu, V, Cr, Zr, Nb, Mo, W, Annealing temperature (K), Annealing Time (s), Primary Crystallization Onset (K), Primary Crystallization Peak (K), Secondary Crystallization Peak (K), Ribbon Thickness (um), Coercivity, Curie Temp, Core Loss, Electrical Resistivity, Permeability, Magnetostriction, Magnetic Saturation, Grain Diameter, LogCoercivity, LogPermeability (total: 56 features)
Meta attributes: Composition ID, Reference DOI

Output data

Features: Si, Nb, Annealing temperature (K), Primary Crystallization Onset (K), Ribbon Thickness (um), Early Weighted Mass, Delta T0
Meta attributes: Composition ID, Reference DOI
Target: Curie Temp

Removed: 48 (W, Relative to Late Early, Cu, Magnetostriction, Coercivity, P, Grain Diameter, Cr, Primary Crystallization Peak (K), Electrical Resistivity, Late Weighted Volume, Relative to Fe GaGe, Delta T1, Total Early Transition, Relative to Early SiCAl, Relative to Fe BP, B, Total Late Transition, Relative to Early BP, Early Weighted Area, Relative to Fe Early, Permeability, LogCoercivity, LogPermeability, Relative to Fe SiCAl, Early Mean Electrons, Secondary Crystallization Peak (K), Relative to Fe Late, V, Late Mean Electrons, Late Weighted Mass, Delta T2, Annealing Time (s), Relative to Late SiCAl, Relative to Late BP, Al, Magnetic Saturation, Zr, Mo, Fe, Ga, Core Loss, Early Weighted Volume, C, Total BP, Total SiCAl, Total GaGe, Late Weighted Area)

Preprocess — Thu Jul 26 18, 13:59:25

Settings

Normalize Features: Center by Median, Scale by SD

Test & Score — Thu Jul 26 18, 13:59:33

Settings

Sampling type: Stratified 20-fold Cross validation

Scores

Method	MSE	RMSE	MAE	R2
kNN	5225.693	72.289	41.396	0.637
Tree	5181.579	71.983	39.741	0.640
SVM	12261.498	110.732	57.847	0.148
Random Forest	3228.787	56.822	30.786	0.776
Neural Network	22430.651	149.769	62.856	-0.559
Linear Regression	13046.699	114.222	72.281	0.093

Tree — Thu Jul 26 18, 14:00:02

Name: Tree

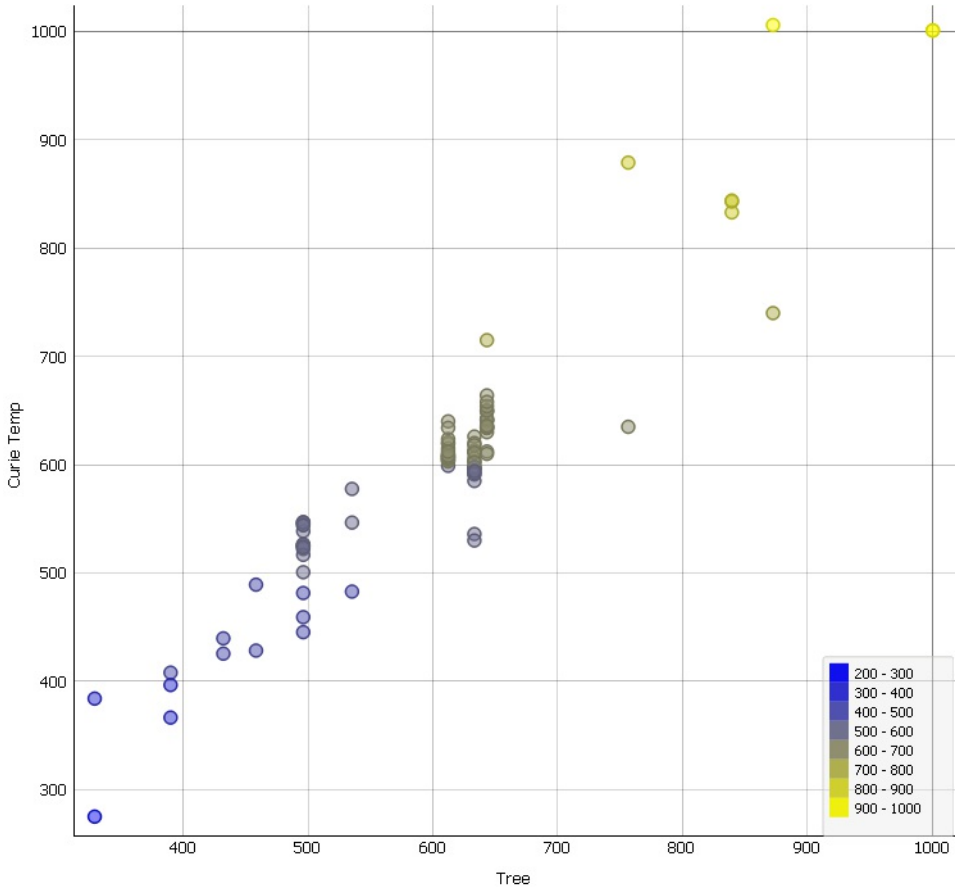
Model parameters

Pruning: at least two instances in leaves, at least four instances in internal nodes, maximum depth 6
Splitting: Stop splitting when majority reaches 95% (classification only)
Binary trees: Yes

Data

Data instances: 94
Features: Si, Nb, Annealing temperature (K), Primary Crystallization Onset (K), Ribbon Thickness (um), Early Weighted Mass, Delta T0
Meta attributes: Composition ID, Reference DOI
Target: Curie Temp

Scatter Plot — Thu Jul 26 18, 14:00:06



Color: Curie Temp

Random Forest — Thu Jul 26 18, 14:00:10

Name: Random Forest

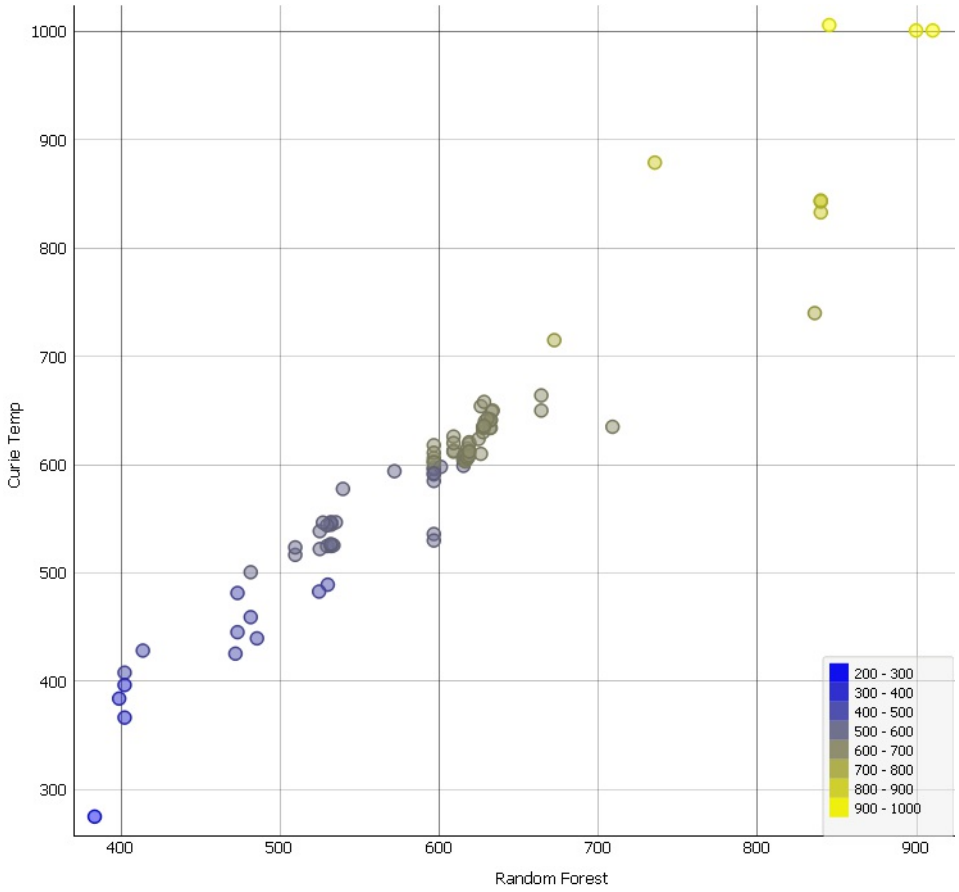
Model parameters

Number of trees: 8
Maximal number of considered features: unlimited
Fixed random seed: 0
Maximal tree depth: 6
Stop splitting nodes with maximum instances: 4

Data

Data instances: 94
Features: Si, Nb, Annealing temperature (K), Primary Crystallization Onset (K), Ribbon Thickness (um), Early Weighted Mass, Delta T0
Meta attributes: Composition ID, Reference DOI
Target: Curie Temp

Scatter Plot Thu Jul 26 18, 14:00:14



Color: Curie Temp

Linear Regression Thu Jul 26 18, 14:00:18

Name: Linear Regression

Model parameters

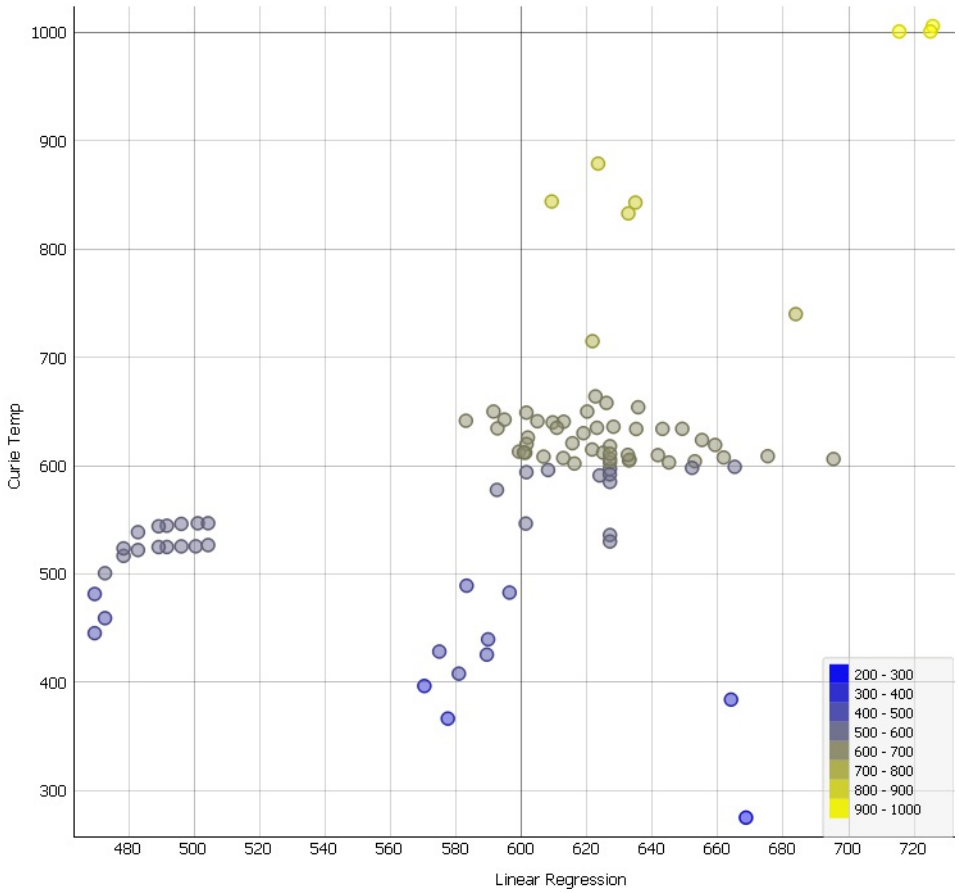
Regularization: No Regularization

Data

Data instances: 94
Features: Si, Nb, Annealing temperature (K), Primary Crystallization Onset (K), Ribbon Thickness (um), Early Weighted Mass, Delta T0
Meta attributes: Composition ID, Reference DOI
Target: Curie Temp

Scatter Plot

Thu Jul 26 18, 14:00:22



Color: Curie Temp

kNN

Thu Jul 26 18, 14:00:29

Name: kNN

Model parameters

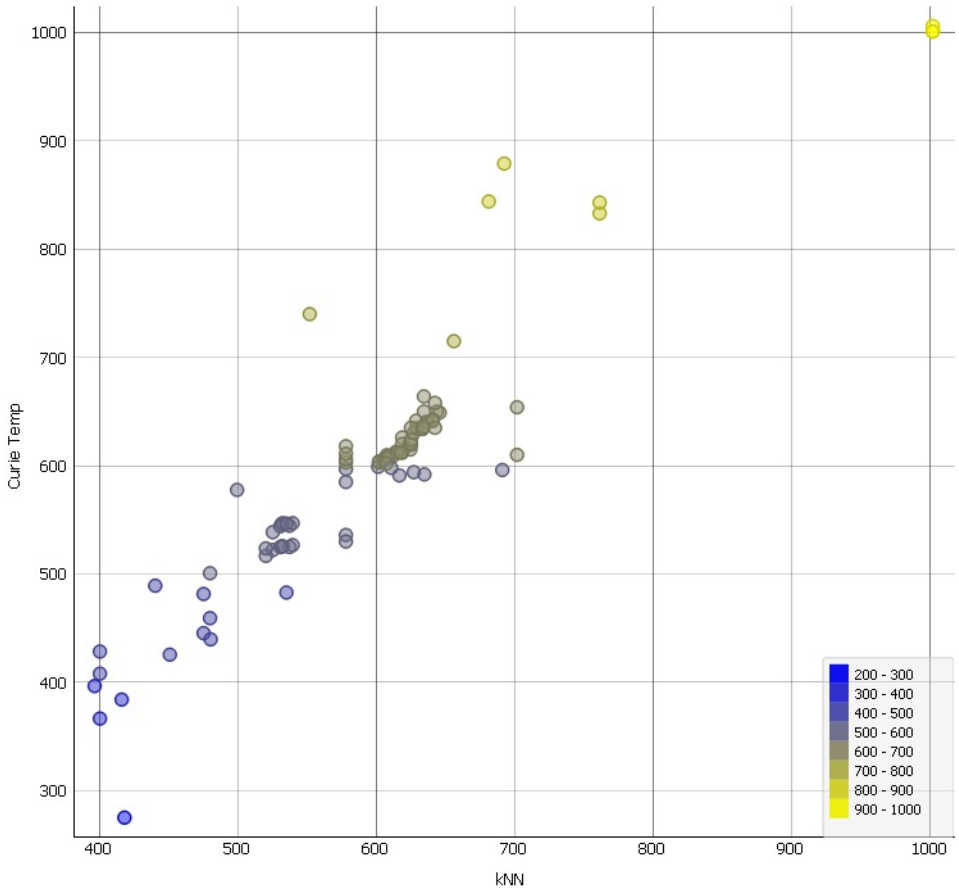
Number of neighbours: 3
Metric: Euclidean
Weight: Uniform

Data

Data instances: 94
Features: Si, Nb, Annealing temperature (K), Primary Crystallization Onset (K), Ribbon Thickness (um), Early Weighted Mass, Delta T0
Meta attributes: Composition ID, Reference DOI
Target: Curie Temp

Scatter Plot

Thu Jul 26 18, 14:00:34



Color: Curie Temp

Neural Network

Thu Jul 26 18, 14:00:39

Name: Neural Network

Model parameters

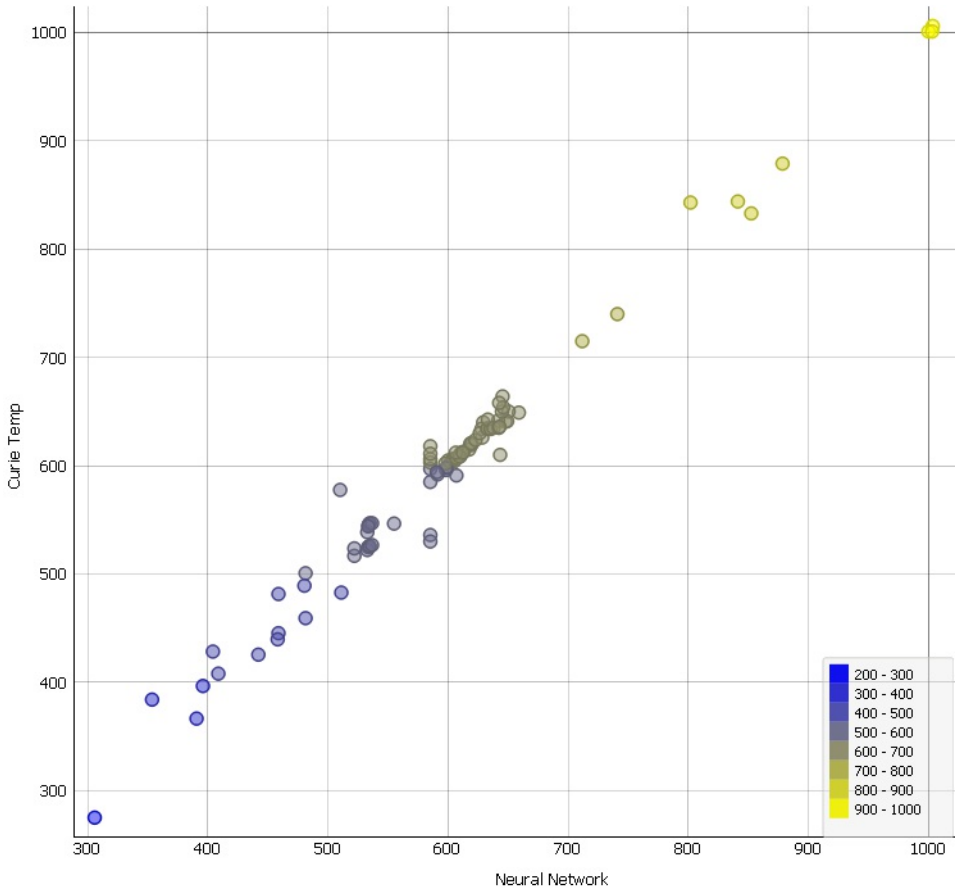
Hidden layers: 40, 20, 10
Activation: ReLu
Solver: Adam
Alpha: 1.0
Max iterations: 5000

Data

Data instances: 94
Features: Si, Nb, Annealing temperature (K), Primary Crystallization Onset (K), Ribbon Thickness (um), Early Weighted Mass, Delta T0
Meta attributes: Composition ID, Reference DOI
Target: Curie Temp

Scatter Plot

Thu Jul 26 18, 14:01:08



Color: Curie Temp

SVM

Thu Jul 26 18, 14:01:12

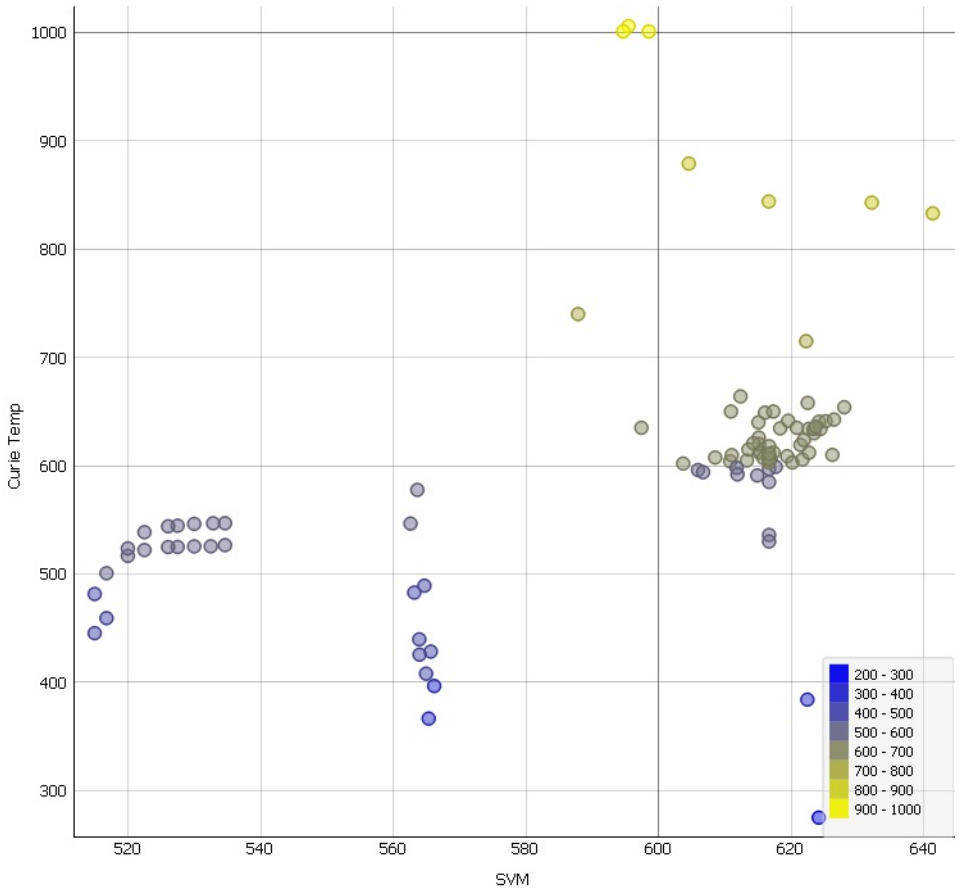
Name: SVM

Model parameters

SVM type: ν-SVM, ν=0.49999999999999994, C=1.9000000000000004
Kernel: Linear
Numerical tolerance: 0.001
Iteration limt: 5000

Data

Data instances: 94
Features: Si, Nb, Annealing temperature (K), Primary Crystallization Onset (K), Ribbon Thickness (um), Early Weighted Mass, Delta T0
Meta attributes: Composition ID, Reference DOI
Target: Curie Temp



Color: Curie Temp