(pymoo) C:\Users\YAOX0\OneDrive\SIMTech 2019\ATPL GAP funding project\(Started) Alloy design\Thermo-Calc Fe-Ni-Ti-Al>python Fe\_Ni\_Ti\_Al\_single\_eq\_metamodel.py

R^2 of the metamodel on Ni3Ti weight percent:

0.9822148588253679

R^2 of the metamodel on Laves weight percent:

0.9905219083601263

R^2 of the metamodel on FCC weight percent:

0.9840275002778642

==========Single objective optimization=========

The minimum objective function value is: -0.5504790647011791

Optimized composition:

Ni = 17.38584524419018wt%

Ti = 3.0122452023243147wt%

Al = 0.4277153149635238wt%

wt% Ni3Ti = [7.78971576]

wt% Laves = [0.]

wt% FCC = [5.01950596]

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(pymoo) C:\Users\YAOX0\OneDrive\SIMTech 2019\ATPL GAP funding project\(Started) Alloy design\Thermo-Calc Fe-Ni-Ti-Al>python Fe\_Ni\_Ti\_Al\_single\_eq\_metamodel.py

R^2 of the metamodel on Ni3Ti weight percent:

0.9822474758183197

R^2 of the metamodel on Laves weight percent:

0.9905219083601263

R^2 of the metamodel on FCC weight percent:

0.9829843528924603

==========Single objective optimization=========

The minimum objective function value is: -0.49425947336685233

Optimized composition:

Ni = 17.63230499912458wt%

Ti = 3.2475589981092217wt%

Al = 3.147519094229639wt%

wt% Ni3Ti = [7.62103775]

wt% Laves = [0.]

wt% FCC = [5.47275531]

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(pymoo) C:\Users\YAOX0\OneDrive\SIMTech 2019\ATPL GAP funding project\(Started) Alloy design\Thermo-Calc Fe-Ni-Ti-Al>python Fe\_Ni\_Ti\_Al\_single\_eq\_metamodel.py

R^2 of the metamodel on Ni3Ti weight percent:

0.9822757964892788

R^2 of the metamodel on Laves weight percent:

0.9905219083601263

R^2 of the metamodel on FCC weight percent:

0.9837916236879094

==========Single objective optimization=========

The minimum objective function value is: -0.4978379733441501

Optimized composition:

Ni = 17.671812664133565wt%

Ti = 3.1756644914039223wt%

Al = 3.1054771435309876wt%

wt% Ni3Ti = [7.61662049]

wt% Laves = [0.]

wt% FCC = [5.43290003]

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(pymoo) C:\Users\YAOX0\OneDrive\SIMTech 2019\ATPL GAP funding project\(Started) Alloy design\Thermo-Calc Fe-Ni-Ti-Al>python Fe\_Ni\_Ti\_Al\_single\_eq\_metamodel.py

R^2 of the metamodel on Ni3Ti weight percent:

0.981776427001844

R^2 of the metamodel on Laves weight percent:

0.9905219083601263

R^2 of the metamodel on FCC weight percent:

0.9837866740534386

==========Single objective optimization=========

The minimum objective function value is: -0.4775351330796999

Optimized composition:

Ni = 17.668374253681268wt%

Ti = 3.2112035514194wt%

Al = 3.137594601662909wt%

wt% Ni3Ti = [7.62706342]

wt% Laves = [0.]

wt% FCC = [5.64840517]

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(pymoo) C:\Users\YAOX0\OneDrive\SIMTech 2019\ATPL GAP funding project\(Started) Alloy design\Thermo-Calc Fe-Ni-Ti-Al>python Fe\_Ni\_Ti\_Al\_single\_eq\_metamodel.py

R^2 of the metamodel on Ni3Ti weight percent:

0.9827206945044797

R^2 of the metamodel on Laves weight percent:

0.9905219083601263

R^2 of the metamodel on FCC weight percent:

0.984193363955286

==========Single objective optimization=========

The minimum objective function value is: -0.48710449064104033

Optimized composition:

Ni = 17.598172089829106wt%

Ti = 3.2666405524066757wt%

Al = 3.2560133438067593wt%

wt% Ni3Ti = [7.62289079]

wt% Laves = [0.]

wt% FCC = [5.54737518]

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(pymoo) C:\Users\YAOX0\OneDrive\SIMTech 2019\ATPL GAP funding project\(Started) Alloy design\Thermo-Calc Fe-Ni-Ti-Al>python Fe\_Ni\_Ti\_Al\_single\_eq\_metamodel.py

R^2 of the metamodel on Ni3Ti weight percent:

0.9832111424993214

R^2 of the metamodel on Laves weight percent:

0.9905219083601263

R^2 of the metamodel on FCC weight percent:

0.983690657211382

==========Single objective optimization=========

The minimum objective function value is: -0.5527236276530395

Optimized composition:

Ni = 17.38851352741005wt%

Ti = 2.922838873939594wt%

Al = 0.053467432507162904wt%

wt% Ni3Ti = [7.80663363]

wt% Laves = [0.]

wt% FCC = [5.00880531]

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(pymoo) C:\Users\YAOX0\OneDrive\SIMTech 2019\ATPL GAP funding project\(Started) Alloy design\Thermo-Calc Fe-Ni-Ti-Al>python Fe\_Ni\_Ti\_Al\_single\_eq\_metamodel.py

R^2 of the metamodel on Ni3Ti weight percent:

0.9830575425780235

R^2 of the metamodel on Laves weight percent:

0.9905219083601263

R^2 of the metamodel on FCC weight percent:

0.9834700078208668

==========Single objective optimization=========

The minimum objective function value is: -0.47803446688202206

Optimized composition:

Ni = 17.518348987187807wt%

Ti = 3.154939497013004wt%

Al = 3.004023448411757wt%

wt% Ni3Ti = [7.63465718]

wt% Laves = [0.]

wt% FCC = [5.64880615]

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(pymoo) C:\Users\YAOX0\OneDrive\SIMTech 2019\ATPL GAP funding project\(Started) Alloy design\Thermo-Calc Fe-Ni-Ti-Al>