

# Machine learning model

BPNN :  $R^2 = 0.65$  RMSE = 108.85

RF :  $R^2 = 0.58$  RMSE = 119.55

Predicted vickers hardness/kg · mm<sup>-2</sup>

800

600

400

200

200

400

600

800

Actual vickers hardness/kg · mm<sup>-2</sup>

## Alloy system

- |                      |                        |
|----------------------|------------------------|
| Cu-Co-Ni-Cr-Al-Fe    | Al-Ti-V-Fe-Ni-Zr-Co    |
| Cu-Co-Ni-Cr-Fe       | Cu-Co-Ni-Cr-Al         |
| Al-Co-Cr-Cu-Fe-Ni    | Cu-Co-Ni-Cr-Al-Fe-Ti-V |
| Al-Co-Cr-Cu-Fe-Ni-Ti | Fe-Co-Ni-Cr-Cu-Al      |
| Al-Co-Cr-Cu-Fe-Ni-V  | Fe-Ni-Cr-Co-Al         |
| Al-Co-Cr-Fe-Mo-Ni    | Fe-Ni-Cr-Cu-Al         |
| Al-Ti-Ni-Mn-B        | Mo-Ti-V-Fe-Ni-Zr       |
| Al-Ti-V-Fe-Ni-Zr     | W-Nb-Mo-Ta             |