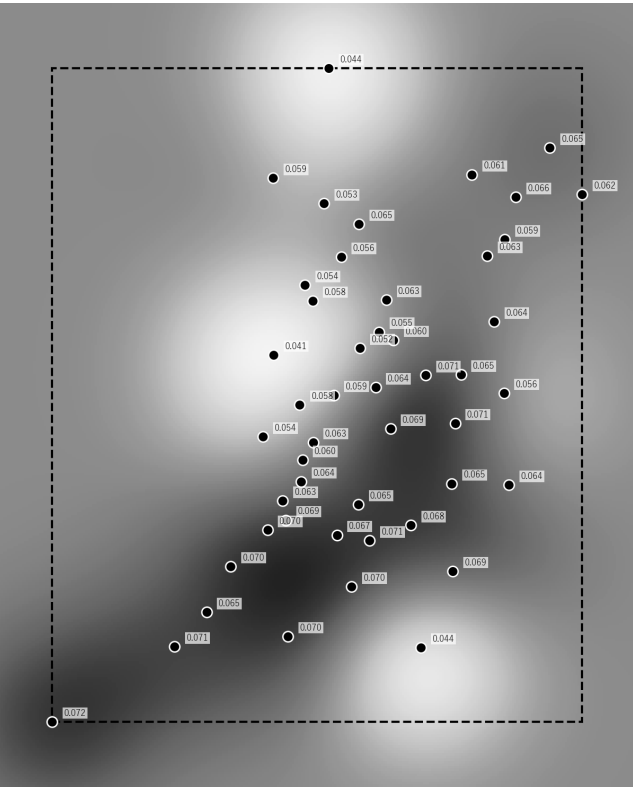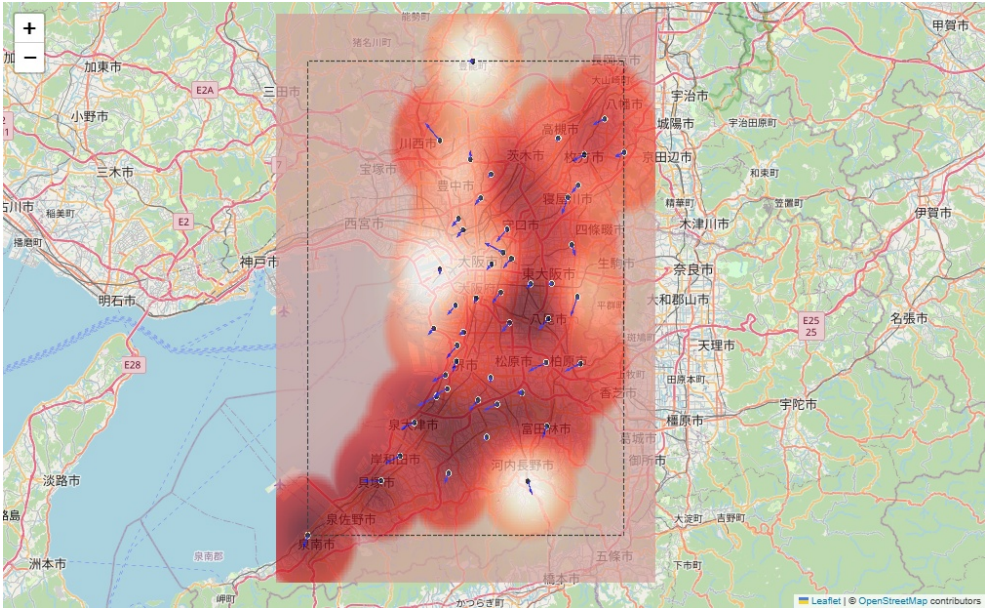# Universal Kriging Interpolation - 大阪府 - 2025/5/12 19H

$$\hat{z}(x_0) = \sum_{i=1}^{n} \lambda_i z(x_i)$$

$\hat{z}(x_0)$: estimated value at location $x_0$

$z(x_i)$: known value at location $x_i$

$\lambda_i$: Kriging weight for $z(x_i)$, based on spatial correlation

$\sum \lambda_i = 1$: weights sum to 1 (unbiasedness condition)

Weights depend on variogram model (e.g., exponential, spherical...)



| Variogram | Transform | RMSE | MAE | R² |
|---|---|---|---|---|
| linear | none | 0.00649 | 0.00450 | 0.210 |
| linear | log | 0.00670 | 0.00462 | 0.158 |
| linear | sqrt | 0.00652 | 0.00452 | 0.205 |
| gaussian | none | 0.00637 | 0.00475 | 0.239 |
| gaussian | log | 0.00697 | 0.00480 | 0.090 |
| gaussian | sqrt | 0.00692 | 0.00477 | 0.103 |
| exponential | none | 0.00647 | 0.00462 | 0.215 |
| exponential | log | 0.00658 | 0.00478 | 0.189 |
| exponential | sqrt | 0.00656 | 0.00477 | 0.193 |
| spherical | none | 0.00641 | 0.00474 | 0.230 |
| spherical | log | 0.00650 | 0.00458 | 0.209 |
| spherical | sqrt | 0.00650 | 0.00454 | 0.209 |



LOOCV - True vs Predicted
RMSE=0.00637, MAE=0.00475, R²=0.239



True vs Predicted (Index order)