

Supplementary material: Sample data for synthetic data experiment

The supplementary material shows one of the 10 datasets with $\text{datasize} = 5000$, clustered objectives and dispersed resources. The explanation of experiment settings for various experiment groups can be found in Table 4 of the main manuscript.

Out of the dataset in a zip file, the file `raw_coordinates.csv` contains the raw coordinates of spatial points. The file contains six columns: `objective_x`, `objective_y`, `resource1_x`, `resource1_y`, `resource2_x` and `resource2_y`, for the (x, y) coordinates of 5000 objective, resource1 and resource2 points, respectively. Part of the data is shown in Figure Supp1.

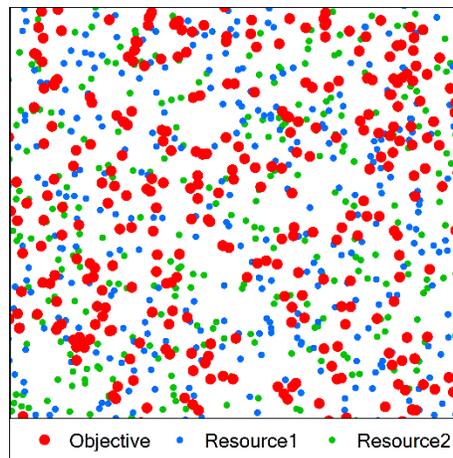


Figure Supp1. Plot of part of dataset, with $(x, y) = (0, 0)$ in the lower-left.

The other six files contain the complete data for experiment groups with different combinations of extraneous factors (0, 10%, 20%) and ‘true’ membership functions for

near1/near2 with respect to their raw values (linear, Gaussian-curve). Attributes in each of the six files are listed in Table Supp1.

Table Supp1. Attributes in complete data files.

Column	Attribute name	Description
1–4	acc_res1_near_C, acc_res1_far_C, acc_res2_near_C, acc_res2_far_C	$\mu_Y(\text{near1})$, $\mu_Y(\text{near1})$, $\mu_N(\text{near2})$ and $\mu_N(\text{near2})$, for experiment
5–8	acc_res1_near_G, acc_res1_far_G, acc_res2_near_G, acc_res2_far_G	group with ‘perceived’ memberships = crisp (C, 0 and 1 values only),
9–12	acc_res1_near_L, acc_res1_far_L, acc_res2_near_L, acc_res2_far_L	Gaussian-curve (G), and linear (L)
13–16	other1_0 ~ other1_3	Expressing categorical attribute values; same values for group with any ‘perceived’ memberships; e.g. for an objective, if other1=0, then other1_0=1 and other1_0 ~ other1_3=0
17–26	other2_0 ~ other2_9	
27–42	noise1_0 ~ noise1_3, noise2_0 ~ noise2_3, noise3_0 ~ noise3_3, noise4_0 ~ noise4_3	
43–44	outcome_good_C, outcome_bad_C	
45–46	outcome_good_G, outcome_bad_G	$\mu_{\text{good}}(\text{outcome})$ and $\mu_{\text{bad}}(\text{outcome})$ for experiment group with
47–48	outcome_good_L, outcome_bad_L	‘perceived’ memberships = crisp, Gaussian-curve, and linear

Users need to select the corresponding complete data file and columns to run different experiment groups. For example, to run the group with 10% extraneous factors, Gaussian-curve ‘true’ membership functions, and linear ‘perceived’ memberships for evaluating RIMs, use columns 9–12, 13–42 and 47–48 in data_realGaus_exfactor10.csv.