Appendix 1. Supplementary figures

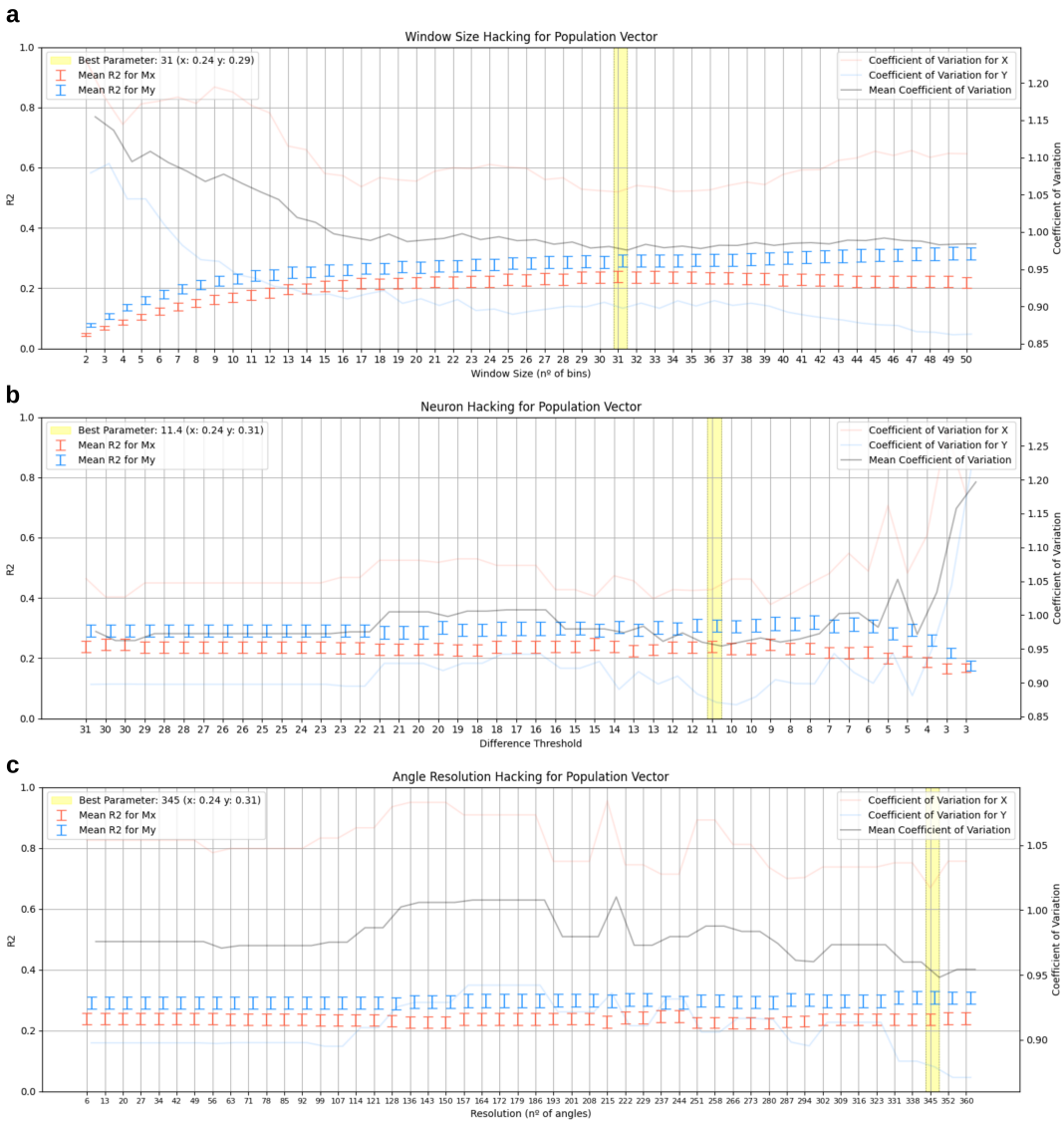

Figure 8. **(a)** Hyperparametrization hacking for the Time Resolution Hyperparameter. The minimal Coefficient of Variance of the R^2 evaluation parameter was minimal when the model ran with a window of size of 31 bins or 155 ms **(b)** Hyperparametrization hacking for the Neuron Removal Threshold Hyperparameter. The minimal Coefficient of Variance of the R^2 evaluation parameter was minimal when the model ran with only neurons that had fitted curves with a Euclidean distance smaller than 11.4 **(c)** Hyperparametrization hacking for the Tuning Resolution Hyperparameter. The minimal Coefficient of Variance of the R^2 evaluation parameter was minimal when the model had the tuning curves built with 345 bins or an angle step of 0.0182 rads or 1.0435º

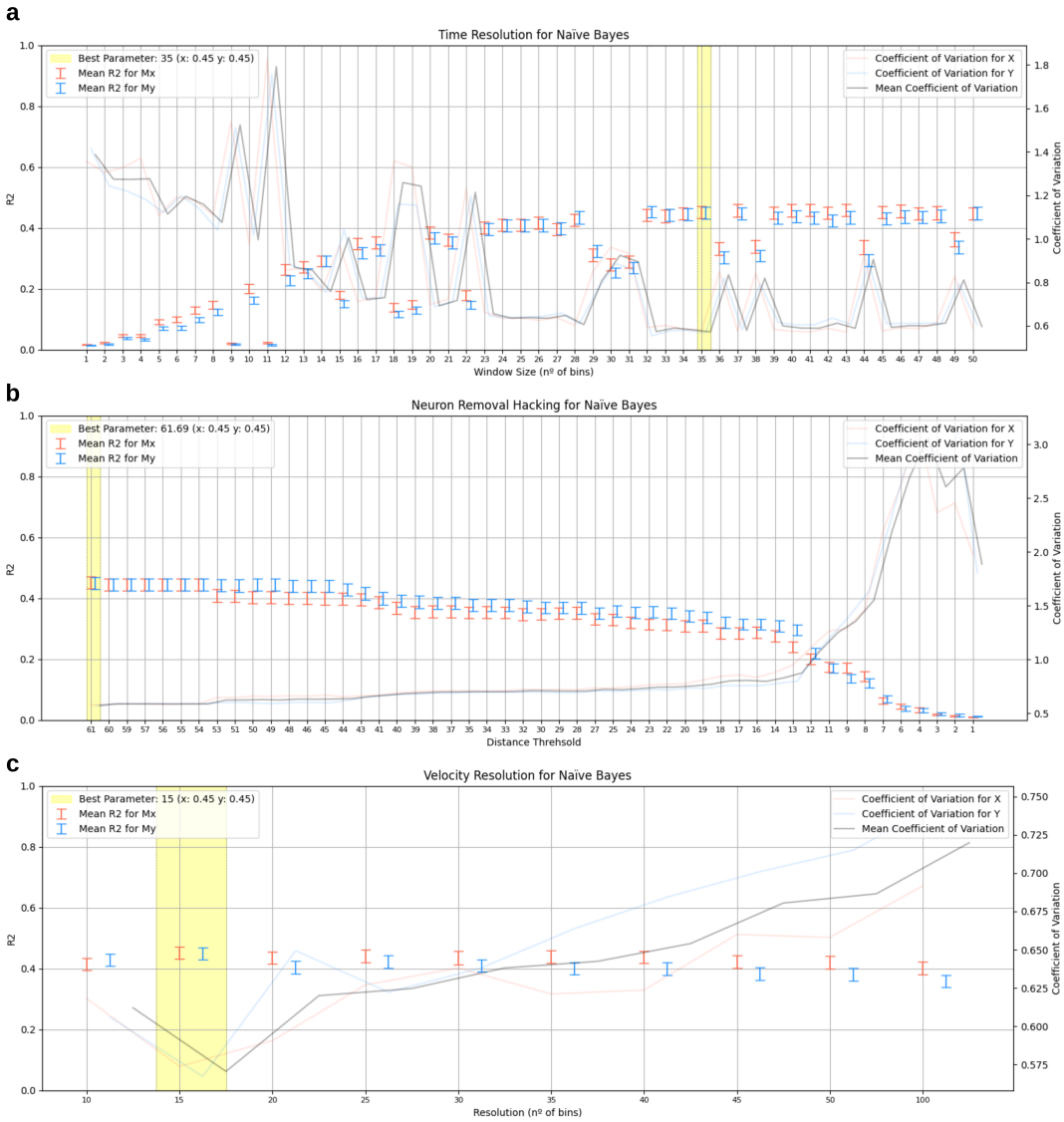

Figure 9. **(a)** Hyperparametrization hacking for the Time Resolution Hyperparameter. The minimal Coefficient of Variance of the R^2 evaluation parameter was minimal when the model ran with a window of size of 35 bins or 175 ms **(b)** Hyperparametrization hacking for the Neuron Removal Threshold Hyperparameter. The minimal Coefficient of Variance of the R^2 evaluation parameter was minimal when the model ran with all neurons **(c)** Hyperparametrization hacking for the Tuning Resolution Hyperparameter. The minimal Coefficient of Variance of the R^2 evaluation parameter was minimal when the model had the tuning surfaces built with 15 bins or a velocity step of 145.06 px/s

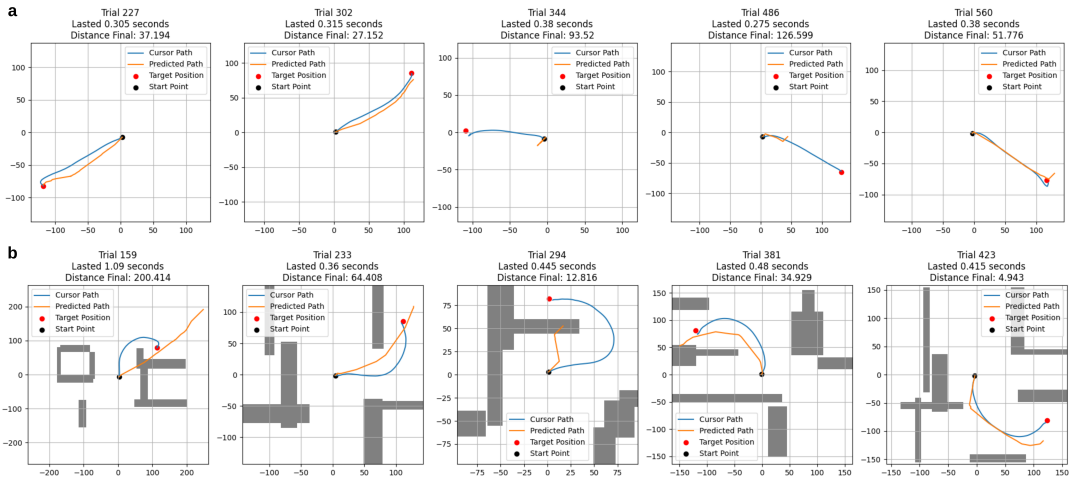

Figure 10. **(a)** Example of predicted trajectories by the optimised Naïve Bayes Model on direct trials **(b)** Example of predicted trajectories by the optimised Naïve Bayes Model on indirect trials

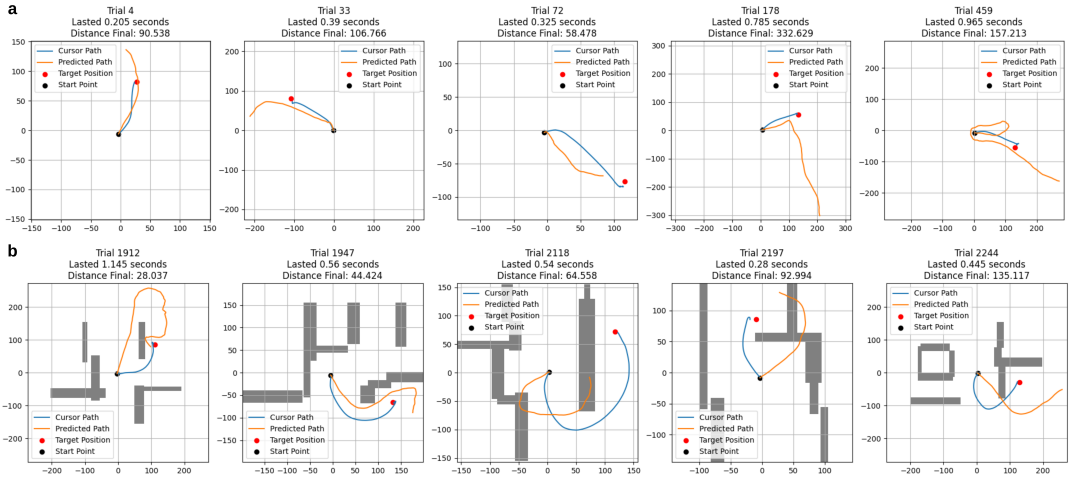

Figure 11. **(a)** Example of predicted trajectories by the optimised Population Vector Model on direct trials **(b)** Example of predicted trajectories by the optimised Population Vector Model on indirect trials

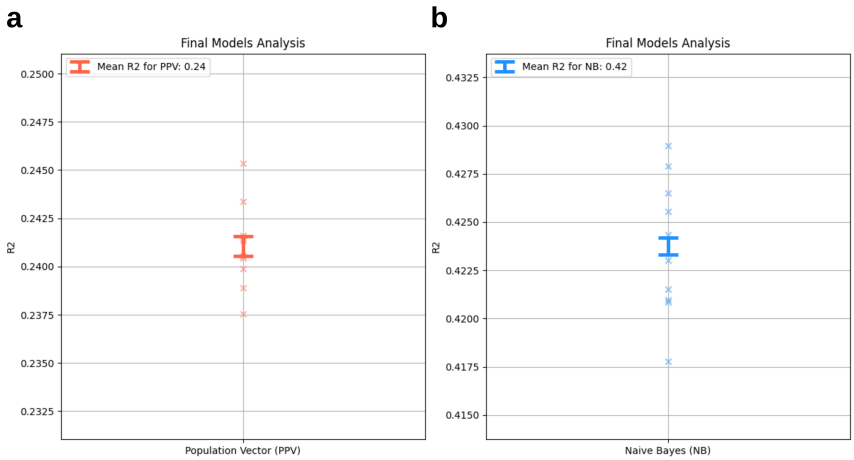

Figure 12. **(a)** Population Vector final model performance. It produced a mean R^2 of about 0.24. The greyed-out crosses represent the 10-fold runs, while the error bars represent the standard error **(b)** Naïve Bayes final model performance. It produced a mean R^2 of about 0.42. The greyed-out crosses represent the 10-fold runs, while the error bars represent the standard error

Table 1. Neuron naming reference

Neuron	1011	1021	1022	1031	1032	1033	1034	1041	1051	1061	1062	1063	1071	1072
Index	0	1	2	3	4	5	6	7	8	9	10	11	12	13
Neuron	1091	1092	1101	1102	1111	1112	1121	1122	1123	1141	1151	1161	1162	1171
Index	14	15	16	17	18	19	20	21	22	23	24	25	26	27
Neuron	1182	1183	1191	1192	1193	1211	1231	1232	1233	1241	1251	1252	1261	1271
Index	28	29	30	31	32	33	34	35	36	37	38	39	40	41
Neuron	1291	1292	1341	1361	1362	1372	1381	1401	1411	1421	1431	1441	1442	1461
Index	42	43	44	45	46	47	48	49	50	51	52	53	54	55
Neuron	1471	1481	1501	1502	1511	1512	1541	1561	1562	1581	1582	1601	1661	1662
Index	56	57	58	59	60	61	62	63	64	65	66	67	68	69
Neuron	1663	1691	1701	1702	1711	1721	1741	1751	1752	1761	1781	1791	1801	1812
Index	70	71	72	73	74	75	76	77	78	79	80	81	82	83
Neuron	1831	1841	1851	1861	1881	1891	1901	1902	2051	2121	2131	2132	2151	2161
Index	84	85	86	87	88	89	90	91	92	93	94	95	96	97
Neuron	2181	2191	2192	2231	2232	2241	2251	2252	2271	2272	2273	2281	2301	2302
Index	98	99	100	101	102	103	104	105	106	107	108	109	110	111
Neuron	2311	2321	2331	2341	2351	2352	2361	2371	2381	2391	2392	2401	2412	2413
Index	112	113	114	115	116	117	118	119	120	121	122	123	124	125
Neuron	2421	2422	2423	2431	2441	2451	2452	2453	2461	2471	2472	2481	2491	2492
Index	126	127	128	129	130	131	132	133	134	135	136	137	138	139
Neuron	2501	2541	2542	2561	2571	2581	2591	2601	2602	2611	2612	2621	2631	2641
Index	140	141	142	143	144	145	146	147	148	149	150	151	152	153
Neuron	2651	2691	2721	2731	2732	2741	2742	2751	2761	2762	2771	2791	2792	2801
Index	154	155	156	157	158	159	160	161	162	163	164	165	166	167
Neuron	2811	2821	2841	2842	2861	2862	2871	2881	2882	2911	2931	2941	2951	2961
Index	168	169	170	171	172	173	174	175	176	177	178	179	180	181