Table S1. Average AUC with standard deviation (parenthesis) of κ-NN ($\kappa=1$) from our system, open system and closed system

Disease	Distance	Multi-hash			Uni-hash		Baseline		
		Our system	Open system	Closed system	Open system	Closed system	Distance	Open system	Closed system
Disorders of lipoid metabolism	Hamming	0.9084 (0.0142)	0.9103 (0.0160)	0.8805 (0.0328)	0.9159 (0.0168)	0.8429 (0.0276)	Euclidean	0.5297 (0.0158)	0.5160 (0.0089)
							Cityblock	0.5268 (0.0115)	0.5216 (0.0108)
							Cosine	0.7116 (0.0312)	0.6866 (0.0297)
							Correlation	0.7070 (0.0301)	0.6800 (0.0294)
Hypertensive chronic kidney disease	Hamming	0.8816 (0.0422)	0.9114 (0.0440)	0.8312 (0.0466)	0.9270 (0.0144)	0.8455 (0.0280)	Euclidean	0.5227 (0.0124)	0.5141 (0.0136)
							Cityblock	0.5225 (0.0138)	0.5295 (0.0190)
							Cosine	0.6873 (0.0193)	0.6781 (0.0224)
							Correlation	0.6871 (0.0204)	0.6757 (0.0221)
Cardiac dysrhythmias	Hamming	0.8807 (0.0290)	0.9183 (0.0444)	0.8633 (0.0390)	0.9072 (0.0092)	0.8181 (0.0427)	Euclidean	0.5324 (0.0146)	0.5230 (0.0112)
							Cityblock	0.5290 (0.0127)	0.5302 (0.0138)
							Cosine	0.6866 (0.0158)	0.6562 (0.0254)
							Correlation	0.6807 (0.0157)	0.6548 (0.0220)
Heart failure	Hamming	0.8786 (0.0309)	0.9171 (0.0327)	0.8594 (0.0420)	0.9089 (0.0182)	0.8414 (0.0331)	Euclidean	0.5315 (0.0106)	0.5191 (0.0127)
							Cityblock	0.5312 (0.0153)	0.5293 (0.0154)
							Cosine	0.6923 (0.0350)	0.6712 (0.0367)
							Correlation	0.6907 (0.0341)	0.6689 (0.0370)
Acute renal failure	Hamming	0.8848 (0.0467)	0.9215 (0.0411)	0.8377 (0.0332)	0.8821 (0.0135)	0.7839 (0.0418)	Euclidean	0.5590 (0.0419)	0.5326 (0.0224)
							Cityblock	0.5737 (0.0390)	0.5516 (0.0252)
							Cosine	0.6609 (0.0335)	0.6408 (0.0277)
							Correlation	0.6603 (0.0347)	0.6423 (0.0268)

Table S2. Average AUC with standard deviation (parenthesis) of κ-NN ($\kappa=3$) from our system, open system and closed system

| Disease | Distance | Multi-hash | | | Uni-hash | | Baseline | | |
		Our system	Open system	Closed system	Open system	Closed system	Distance	Open system	Closed system
Disorders of lipoid metabolism	Hamming	0.9330 (0.0086)	0.9343 (0.0125)	0.9002 (0.0285)	0.9159 (0.0168)	0.8486 (0.0271)	Euclidean	0.5329 (0.0148)	0.5361 (0.0167)
							Cityblock	0.5341 (0.0121)	0.5639 (0.0269)
							Cosine	0.8079 (0.0222)	0.7945 (0.0308)
							Correlation	0.8043 (0.0244)	0.7824 (0.0299)
Hypertensive chronic kidney disease	Hamming	0.9078 (0.0346)	0.9283 (0.0432)	0.8538 (0.0421)	0.9270 (0.0144)	0.8501 (0.0305)	Euclidean	0.5506 (0.0325)	0.5584 (0.0323)
							Cityblock	0.5727 (0.0404)	0.5762 (0.0311)
							Cosine	0.7823 (0.0261)	0.7762 (0.0262)
							Correlation	0.7807 (0.0272)	0.7718 (0.0300)
Cardiac dysrhythmias	Hamming	0.9135 (0.0287)	0.9368 (0.0492)	0.8833 (0.0397)	0.9072 (0.0092)	0.8236 (0.0328)	Euclidean	0.5378 (0.0230)	0.5319 (0.0171)
							Cityblock	0.5456 (0.0225)	0.5500 (0.0237)
							Cosine	0.7695 (0.0151)	0.7340 (0.0343)
							Correlation	0.7660 (0.0144)	0.7284 (0.0320)
Heart failure	Hamming	0.9058 (0.0282)	0.9351 (0.0326)	0.8798 (0.0414)	0.9089 (0.0182)	0.8471 (0.0248)	Euclidean	0.5452 (0.0209)	0.5357 (0.0182)
							Cityblock	0.5534 (0.0281)	0.5462 (0.0235)
							Cosine	0.7986 (0.0292)	0.7733 (0.0421)
							Correlation	0.7949 (0.0281)	0.7643 (0.0415)
Acute renal failure	Hamming	0.9169 (0.0397)	0.9477 (0.0374)	0.8637 (0.0320)	0.8821 (0.0135)	0.7929 (0.0378)	Euclidean	0.5632 (0.0437)	0.5447 (0.0313)
							Cityblock	0.5958 (0.0355)	0.5721 (0.0291)
							Cosine	0.7434 (0.0380)	0.7289 (0.0341)
							Correlation	0.7427 (0.0380)	0.7281 (0.0347)

Table S3. Average AUC with standard deviation (parenthesis) of κ-NN (κ=9) from our system, open system and closed system

| Disease | Distance | Multi-hash | | | Uni-hash | | Baseline | | |
		Our system	Open system	Closed system	Open system	Closed system	Distance	Open system	Closed system
Disorders of lipoid metabolism	Hamming	0.9458 (0.0074)	0.9482 (0.0175)	0.9204 (0.0239)	0.9159 (0.0168)	0.8524 (0.0259)	Euclidean	0.5643 (0.0198)	0.5687 (0.0334)
							Cityblock	0.6116 (0.0360)	0.6162 (0.0336)
							Cosine	0.8795 (0.0225)	0.8596 (0.0232)
							Correlation	0.8745 (0.0227)	0.8489 (0.0248)
Hypertensive chronic kidney disease	Hamming	0.9278 (0.0332)	0.9409 (0.0322)	0.8710 (0.0371)	0.9270 (0.0144)	0.8555 (0.0302)	Euclidean	0.6554 (0.0503)	0.6199 (0.0320)
							Cityblock	0.6906 (0.0457)	0.6798 (0.0435)
							Cosine	0.8724 (0.0176)	0.8536 (0.0235)
							Correlation	0.8683 (0.0218)	0.8498 (0.0250)
Cardiac dysrhythmias	Hamming	0.9330 (0.0250)	0.9433 (0.0461)	0.9042 (0.0361)	0.9072 (0.0092)	0.8290 (0.0423)	Euclidean	0.5705 (0.0262)	0.5400 (0.0190)
							Cityblock	0.5913 (0.0355)	0.5913 (0.0323)
							Cosine	0.8383 (0.0170)	0.8064 (0.0236)
							Correlation	0.8327 (0.0131)	0.7968 (0.0228)
Heart failure	Hamming	0.9273 (0.0207)	0.9464 (0.0320)	0.9006 (0.0395)	0.9089 (0.0182)	0.8549 (0.0335)	Euclidean	0.5614 (0.0475)	0.5607 (0.0309)
							Cityblock	0.6145 (0.0562)	0.6062 (0.0586)
							Cosine	0.8620 (0.0310)	0.8304 (0.0338)
							Correlation	0.8587 (0.0305)	0.8239 (0.0344)
Acute renal failure	Hamming	0.9342 (0.0370)	0.9568 (0.0360)	0.8843 (0.0308)	0.8821 (0.0135)	0.7982 (0.0375)	Euclidean	0.5890 (0.0621)	0.5695 (0.0327)
							Cityblock	0.6235 (0.0700)	0.6198 (0.0407)
							Cosine	0.8222 (0.0254)	0.8012 (0.0271)
							Correlation	0.8230 (0.0260)	0.8002 (0.0279)