Supplementary File

Table 1 Original features of a transaction dataset

Attributes name	Description
Id	The unique identity of a user
Ms_limit	The maximum allowable single transaction amount for a user
Md_limit	The maximum allowable daily transaction amount for a user
N_phone	The common mobile phone number of a user
C_ip	Is IP commonly used for transactions
Area	Transaction location
T_date	Transaction date
T_time	Transaction time
T_amount	Transaction amount
C_ablance	Balance prior to payment
T_object	Recipient ID (individual or business)
C_mac	The MAC address of the client during the transaction
Label	Fraudulent or Legitimate

Table 2 Data partitioning

Dataset	#L	#F	#S
D_1	656416	28175	666591
D_2	657899	33762	691661
D_3	226206	10601	264807
D_4	1229764	23271	1243035
D_5	1189117	27122	1216299
D_6	1017816	24898	1042714

Table 3 Classification confusion matrix

	Actual positive	Actual negative
Predicted positive	T_P	F_P
Predicted negative	F_N	T_N

Table 4 Sensitivity of the length of transaction memory

Memory Length	P_r	R_e	F_1	AUC
10	0.969	0.886	0.926	0.942
20	0.978	0.893	0.933	0.946
30	0.985	0.900	0.941	0.950
40	0.982	0.909	0.944	0.954
50	0.982	0.913	0.946	0.956
60	0.980	0.912	0.945	0.955
70	0.979	0.916	0.946	0.956