

# Open access dataset, code library and deep learning benchmark for state-of-health estimation of lithium-ion batteries

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## Appendix A. Dataset

## Appendix B. Feature engineering

## Appendix C. Results

**Note:** The preliminary experimental results are given in Table C.1 to Table C.18, where each table details the evaluation results of each battery on the 5 models. Table C.19 to Table C.24 give some reprocessing results based on the first 18 tables.

Table C.1: The results of Toyota-MIT-Stanford dataset, the input type is complete charging data with  $[-1, 1]$  normalization. The best result was **bolded**.

Model		CNN			LSTM			GRU			MLP			Attention		
Group	Battery	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
1	1	12.196	13.408	0.243	8.932	10.320	0.405	9.015	10.317	0.390	<b>6.902</b>	<b>7.875</b>	<b>0.195</b>	6.912	7.961	0.239
	2	50.115	53.972	3.463	12.897	14.016	0.236	12.814	13.938	0.219	12.392	13.496	<b>0.200</b>	<b>11.904</b>	<b>13.011</b>	0.222
	3	<b>3.400</b>	<b>3.750</b>	<b>0.027</b>	14.767	16.130	0.325	13.439	14.707	0.276	11.984	13.139	0.213	4.995	5.596	0.074
	4	6.393	6.979	<b>0.060</b>	6.554	7.436	0.137	6.507	7.317	0.120	7.665	8.418	0.089	<b>6.143</b>	<b>6.823</b>	0.065
	5	15.089	16.217	<b>0.332</b>	17.134	19.328	0.655	19.062	21.298	0.669	17.801	19.931	0.601	<b>13.375</b>	<b>14.903</b>	0.387
2	1	21.944	23.548	0.561	16.330	18.230	0.679	13.617	15.271	0.527	8.598	9.600	0.232	<b>7.341</b>	<b>8.158</b>	<b>0.192</b>
	2	<b>15.915</b>	<b>17.345</b>	0.512	20.780	23.006	0.681	25.045	27.493	0.839	25.265	27.613	0.764	17.301	18.907	<b>0.387</b>
	3	46.272	49.822	2.596	21.030	23.400	0.771	21.441	23.727	0.714	7.096	7.900	0.124	<b>6.564</b>	<b>7.305</b>	<b>0.110</b>
	4	49.749	52.401	3.518	20.502	21.953	0.585	18.469	19.740	0.475	<b>4.917</b>	<b>5.467</b>	<b>0.109</b>	6.723	7.398	0.161
	5	<b>10.151</b>	<b>10.819</b>	<b>0.145</b>	30.834	32.613	1.122	32.505	34.394	1.214	31.648	33.535	1.062	19.452	20.785	0.466
3	1	7.936	8.714	0.111	<b>5.818</b>	<b>6.503</b>	<b>0.102</b>	8.014	8.854	0.125	30.114	32.765	1.310	22.554	24.736	0.766
	2	7.699	8.290	<b>0.090</b>	9.346	10.559	0.280	7.307	8.341	0.230	9.605	10.844	0.287	<b>6.020</b>	<b>6.868</b>	0.165
	3	<b>3.252</b>	<b>3.562</b>	<b>0.018</b>	10.388	11.375	0.157	10.841	11.855	0.157	10.070	11.054	0.141	8.503	9.405	0.138
	4	38.914	41.862	2.306	8.117	8.930	0.137	7.116	7.846	0.114	<b>6.991</b>	<b>7.680</b>	<b>0.104</b>	7.963	8.736	0.135
	5	<b>4.843</b>	<b>5.316</b>	<b>0.037</b>	13.951	15.526	0.377	14.557	16.089	0.374	13.888	15.350	0.330	11.615	12.858	0.268
4	1	18.361	19.425	0.648	11.942	13.038	0.266	10.336	11.325	0.221	7.266	7.988	0.182	<b>5.135</b>	<b>5.667</b>	<b>0.087</b>
	2	4.587	5.014	<b>0.036</b>	<b>4.139</b>	<b>4.674</b>	0.072	4.781	5.321	0.066	6.416	7.102	0.086	5.050	5.601	0.058
	3	9.449	10.391	0.172	9.988	10.919	0.152	11.515	12.566	0.192	8.379	9.253	0.133	<b>7.734</b>	<b>8.515</b>	<b>0.113</b>
	4	5.874	6.278	<b>0.045</b>	6.312	7.068	0.162	5.577	6.257	0.143	<b>4.470</b>	<b>5.045</b>	0.107	5.416	6.025	0.093
	5	<b>6.196</b>	<b>6.621</b>	<b>0.045</b>	10.235	11.368	0.252	11.522	12.661	0.264	8.368	9.235	0.183	7.732	8.465	0.123
5	1	18.194	19.526	0.743	16.798	18.766	0.710	17.225	19.123	0.639	17.504	18.944	0.360	<b>7.712</b>	<b>8.500</b>	<b>0.143</b>
	2	22.674	24.114	0.892	25.176	27.293	0.963	23.094	25.119	0.870	<b>7.791</b>	<b>8.659</b>	0.242	8.919	9.658	<b>0.162</b>
	3	27.402	29.441	1.304	19.637	21.846	0.891	21.084	23.159	0.764	9.547	10.404	0.154	<b>7.766</b>	<b>8.426</b>	<b>0.108</b>
	4	113.834	122.616	13.646	<b>20.234</b>	<b>22.589</b>	<b>0.831</b>	24.674	27.157	0.956	30.295	32.682	1.030	33.403	35.937	1.292
	5	50.129	53.501	3.494	90.570	97.629	8.655	127.024	136.394	16.437	48.980	52.862	2.655	<b>30.483</b>	<b>33.169</b>	<b>1.332</b>

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Model		CNN			LSTM			GRU			MLP			Attention		
Group	Battery	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
6	1	<b>4.452</b>	<b>4.963</b>	<b>0.078</b>	9.453	10.360	0.197	8.570	9.393	0.163	4.546	5.102	0.123	4.739	5.265	0.099
	2	<b>7.112</b>	<b>7.780</b>	<b>0.133</b>	13.821	14.776	0.281	14.503	15.495	0.292	13.951	14.921	0.299	10.766	11.585	0.214
	3	6.287	<b>6.828</b>	<b>0.060</b>	<b>6.287</b>	6.965	0.100	6.855	7.498	0.093	11.448	12.592	0.210	6.624	7.312	0.091
	4	<b>4.452</b>	<b>4.774</b>	<b>0.039</b>	7.228	7.962	0.156	8.042	8.766	0.158	11.326	12.227	0.267	10.338	11.194	0.218
	5	26.556	28.512	1.396	6.495	7.257	0.130	7.058	7.777	0.125	6.380	7.034	0.091	<b>5.249</b>	<b>5.863</b>	<b>0.075</b>
7	1	<b>10.522</b>	<b>11.333</b>	<b>0.127</b>	17.391	18.689	0.351	17.114	18.398	0.343	11.893	12.901	0.230	13.643	14.774	0.277
	2	<b>6.224</b>	<b>6.791</b>	<b>0.048</b>	17.734	19.594	0.403	17.457	19.175	0.372	17.608	19.207	0.371	9.111	10.020	0.126
	3	<b>10.290</b>	<b>11.116</b>	<b>0.127</b>	11.988	13.065	0.193	12.478	13.544	0.199	25.144	27.224	0.685	14.699	16.053	0.276
	4	7.297	<b>7.854</b>	<b>0.089</b>	7.999	8.964	0.227	<b>7.244</b>	8.119	0.205	11.399	12.752	0.377	7.562	8.348	0.176
	5	8.357	9.162	0.115	6.491	7.279	0.112	6.831	7.559	0.111	<b>3.377</b>	<b>3.846</b>	<b>0.057</b>	7.404	8.155	0.097
8	1	<b>9.419</b>	<b>10.264</b>	0.299	22.521	24.865	0.581	21.337	23.442	0.525	18.866	20.685	0.432	14.565	15.956	<b>0.277</b>
	2	28.522	30.139	2.001	14.033	15.135	0.288	11.285	12.248	0.218	<b>4.891</b>	<b>5.441</b>	<b>0.114</b>	6.825	7.564	0.142
	3	9.344	9.980	0.148	7.604	8.436	0.178	6.785	7.523	0.147	<b>4.730</b>	<b>5.293</b>	0.112	4.856	5.383	<b>0.093</b>
	4	10.593	11.440	<b>0.202</b>	<b>8.441</b>	<b>9.360</b>	0.207	8.615	9.538	0.206	17.315	18.537	0.351	17.362	18.556	0.409
	5	13.288	14.278	0.222	<b>12.296</b>	<b>13.413</b>	<b>0.205</b>	13.250	14.444	0.231	26.823	29.142	0.861	16.152	17.681	0.369
9	1	33.402	35.852	2.355	8.131	9.109	0.184	9.695	10.654	0.191	8.467	9.488	0.189	<b>7.547</b>	<b>8.369</b>	<b>0.135</b>
	2	34.523	37.414	1.694	26.971	29.265	0.789	24.526	26.644	0.671	21.657	23.674	0.690	<b>20.583</b>	<b>22.478</b>	<b>0.643</b>
	3	<b>5.808</b>	<b>6.274</b>	<b>0.067</b>	9.921	11.103	0.323	8.277	9.318	0.279	7.045	8.002	0.267	6.884	7.768	0.220
	4	15.715	16.698	0.419	8.445	9.385	0.216	8.049	8.886	0.179	6.458	7.152	0.160	<b>5.504</b>	<b>6.139</b>	<b>0.137</b>
	5	<b>5.473</b>	<b>5.926</b>	<b>0.045</b>	8.344	9.454	0.248	8.271	9.329	0.219	5.956	6.753	0.151	6.604	7.496	0.176

**Note:** (1). All values are the average value of 3 experiments; (2). For intuitive display, all values have been magnified 1000 times.

Table C.2: The results of Toyota-MIT-Stanford dataset, the input type is partial charging data with  $[-1, 1]$  normalization. The best result was **bolded**.

Model		CNN			LSTM			GRU			MLP			Attention		
Group	Battery	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
1	1	7.692	8.335	0.132	<b>3.986</b>	<b>4.366</b>	<b>0.052</b>	4.593	5.078	0.078	5.555	6.057	0.067	5.653	6.117	<b>0.048</b>
	2	13.744	14.801	0.434	14.334	15.146	0.240	14.271	15.203	0.250	7.464	7.893	<b>0.105</b>	<b>6.868</b>	<b>7.446</b>	<b>0.106</b>
	3	9.182	9.892	0.112	8.527	9.393	0.129	8.478	9.340	0.131	<b>5.406</b>	<b>5.994</b>	0.075	5.916	6.468	<b>0.063</b>
	4	4.233	4.544	0.033	12.013	12.700	0.184	10.711	11.446	0.160	<b>3.737</b>	<b>4.036</b>	<b>0.031</b>	3.999	4.327	0.037
	5	18.790	20.413	0.725	12.256	13.377	0.194	13.851	15.113	0.240	4.656	5.129	0.056	<b>2.956</b>	<b>3.260</b>	<b>0.023</b>
2	1	77.413	82.289	6.558	8.670	<b>9.632</b>	0.322	<b>8.661</b>	9.637	0.345	21.118	22.731	0.723	11.551	12.585	<b>0.289</b>
	2	56.191	60.800	3.739	13.055	14.348	0.302	15.137	16.563	0.359	<b>5.804</b>	<b>6.460</b>	0.112	6.544	7.244	<b>0.102</b>
	3	28.433	30.865	1.094	14.178	15.428	0.272	13.488	14.669	0.262	<b>9.093</b>	<b>9.962</b>	<b>0.128</b>	16.769	18.047	0.329
	4	55.747	59.043	3.986	12.554	13.474	0.256	13.627	14.704	0.300	7.545	8.146	0.117	<b>6.635</b>	<b>7.240</b>	<b>0.104</b>
	5	43.247	45.827	2.387	14.109	15.077	0.287	13.614	14.539	0.271	11.385	12.057	0.206	<b>6.392</b>	<b>6.941</b>	<b>0.085</b>
3	1	25.117	27.084	1.745	8.724	9.670	0.148	10.807	11.949	0.201	<b>5.013</b>	<b>5.554</b>	<b>0.054</b>	8.349	9.054	0.114
	2	39.108	42.363	1.776	16.977	18.494	0.435	20.603	22.374	0.529	15.932	17.383	0.409	<b>14.035</b>	<b>15.261</b>	<b>0.291</b>
	3	6.570	7.054	0.067	8.623	9.367	0.179	7.784	8.575	0.197	<b>5.402</b>	<b>5.891</b>	<b>0.063</b>	10.881	11.741	0.179
	4	57.873	61.279	4.074	7.900	8.518	0.137	8.653	9.398	0.155	5.793	6.275	0.066	<b>4.762</b>	<b>5.179</b>	<b>0.046</b>
	5	12.626	13.537	0.263	10.410	11.422	0.207	13.578	14.869	0.302	6.726	7.341	<b>0.073</b>	<b>6.454</b>	<b>7.010</b>	<b>0.070</b>
4	1	15.149	16.464	0.453	16.157	17.935	0.338	15.907	17.683	0.329	<b>9.322</b>	<b>10.517</b>	<b>0.154</b>	9.854	11.039	0.175
	2	26.494	27.933	1.130	10.477	11.218	0.143	10.008	10.812	0.159	4.936	5.365	0.054	<b>3.742</b>	<b>4.132</b>	<b>0.041</b>
	3	5.020	5.365	0.048	7.550	8.142	0.090	6.531	7.178	0.112	4.056	4.458	<b>0.037</b>	<b>3.585</b>	<b>3.961</b>	<b>0.039</b>
	4	17.348	18.597	0.690	<b>5.622</b>	<b>6.148</b>	0.094	5.878	6.476	0.111	7.614	8.150	<b>0.080</b>	10.900	11.856	0.236
	5	16.468	17.723	0.648	4.589	5.089	0.058	4.117	4.638	0.076	<b>3.728</b>	<b>4.143</b>	0.041	4.686	5.085	<b>0.031</b>
5	1	4.522	4.980	<b>0.031</b>	4.996	5.843	0.145	5.993	6.997	0.195	5.278	5.948	0.066	<b>4.009</b>	<b>4.489</b>	0.045
	2	8.651	9.361	0.114	5.113	5.595	0.053	7.045	7.741	0.101	5.088	5.526	0.055	<b>3.574</b>	<b>3.894</b>	<b>0.023</b>
	3	24.535	26.371	1.331	4.488	4.931	0.053	<b>3.713</b>	<b>4.181</b>	0.072	4.617	5.051	<b>0.040</b>	5.467	5.985	0.059
	4	26.661	29.003	1.182	7.241	8.139	0.110	7.166	8.098	0.129	5.033	5.656	0.063	<b>4.507</b>	<b>4.994</b>	<b>0.036</b>
	5	23.650	25.423	0.839	12.688	13.912	0.315	9.875	11.020	0.271	<b>6.483</b>	<b>7.146</b>	<b>0.084</b>	12.226	13.164	0.228
6	1	19.806	20.785	0.987	11.062	11.822	0.150	10.900	11.750	0.165	12.144	12.903	0.279	<b>5.320</b>	<b>5.779</b>	<b>0.075</b>
	2	32.167	34.788	1.459	8.417	9.222	0.106	7.587	8.337	0.092	<b>3.947</b>	<b>4.385</b>	<b>0.043</b>	6.628	7.212	0.064
	3	74.740	80.365	6.224	9.158	10.257	0.198	<b>5.380</b>	<b>6.056</b>	<b>0.100</b>	5.554	6.179	<b>0.095</b>	7.804	8.666	0.137
	4	13.016	13.870	0.441	4.167	4.534	0.044	<b>3.249</b>	<b>3.617</b>	0.054	4.234	4.623	0.040	3.595	3.889	<b>0.025</b>
	5	24.964	26.749	0.735	3.983	4.416	0.051	4.853	5.381	0.071	3.810	4.221	0.038	<b>3.452</b>	<b>3.802</b>	<b>0.032</b>
7	1	9.092	9.895	0.126	9.124	10.177	0.223	9.391	10.394	0.234	<b>3.657</b>	<b>4.026</b>	<b>0.047</b>	8.820	9.517	0.094

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Model		CNN			LSTM			GRU			MLP			Attention		
Group	Battery	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
	2	80.699	85.645	6.876	17.218	18.489	0.418	18.652	20.018	0.509	9.753	10.525	0.261	<b>9.574</b>	<b>10.296</b>	<b>0.129</b>
	3	36.146	38.680	1.567	12.975	14.217	0.305	13.192	14.453	0.350	3.301	3.673	0.045	<b>2.931</b>	<b>3.221</b>	<b>0.024</b>
	4	36.299	39.415	3.078	20.571	22.562	0.663	21.245	23.348	0.731	14.869	15.983	0.542	<b>9.567</b>	<b>10.451</b>	<b>0.160</b>
	5	76.133	80.525	7.591	59.753	64.214	3.791	103.024	110.135	10.901	<b>20.206</b>	<b>21.603</b>	<b>0.460</b>	22.353	23.806	0.682
8	1	7.907	8.501	0.112	8.693	9.353	0.111	9.685	10.465	0.132	<b>5.362</b>	<b>5.866</b>	<b>0.073</b>	11.449	12.399	0.193
	2	11.604	12.678	0.264	10.894	12.013	0.169	10.556	11.591	0.162	<b>3.520</b>	<b>3.981</b>	<b>0.043</b>	7.791	8.527	0.095
	3	7.455	8.089	0.180	3.533	3.930	0.049	3.205	3.567	0.045	<b>2.812</b>	<b>3.162</b>	<b>0.031</b>	6.556	7.222	0.093
	4	<b>5.598</b>	<b>6.120</b>	<b>0.080</b>	11.249	12.098	0.157	10.662	11.668	0.204	5.841	6.501	0.124	8.120	8.791	0.130
	5	9.099	9.995	0.154	9.418	10.411	0.136	7.939	8.745	0.105	<b>4.314</b>	<b>4.786</b>	<b>0.043</b>	12.735	13.866	0.206
9	1	10.939	12.060	0.286	10.135	11.159	0.138	9.843	10.845	0.130	<b>4.166</b>	<b>4.696</b>	<b>0.057</b>	8.753	9.597	0.116
	2	22.412	24.183	0.992	7.345	8.078	0.123	6.681	7.443	0.138	4.957	5.511	0.068	<b>3.966</b>	<b>4.377</b>	<b>0.033</b>
	3	31.117	33.491	1.177	<b>3.305</b>	<b>3.752</b>	<b>0.044</b>	4.498	5.079	0.071	5.685	6.288	0.061	6.405	6.990	0.053
	4	15.118	16.013	0.446	<b>10.644</b>	<b>11.431</b>	<b>0.173</b>	11.367	12.246	0.197	14.926	15.920	0.404	11.331	12.194	0.188
	5	20.736	22.343	1.143	<b>3.119</b>	<b>3.589</b>	0.072	3.601	4.136	0.092	4.047	4.495	<b>0.037</b>	4.667	5.183	0.062

**Note:** (1). All values are the average value of 3 experiments; (2). For intuitive display, all values have been magnified 1000 times.

Table C.3: The results of Toyota-MIT-Stanford dataset, the input type is handcraft features with  $[-1, 1]$  normalization. The best result was **bolded**.

Model		CNN			LSTM			GRU			MLP			Attention		
Group	Battery	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
1	1	7.106	7.723	0.081	6.797	7.465	0.066	<b>4.764</b>	<b>5.205</b>	<b>0.035</b>	5.396	5.885	0.044	10.011	10.970	0.138
	2	6.197	6.711	0.052	5.170	5.633	0.041	4.793	5.217	0.031	5.695	6.148	0.039	<b>3.089</b>	<b>3.424</b>	<b>0.019</b>
	3	<b>4.460</b>	<b>4.869</b>	<b>0.031</b>	7.718	8.324	0.075	9.035	9.711	0.095	9.278	9.957	0.101	11.117	12.005	0.153
	4	8.892	9.537	0.106	10.051	10.702	0.126	9.325	9.901	0.106	10.007	10.615	0.121	<b>7.454</b>	<b>8.038</b>	<b>0.084</b>
	5	<b>2.084</b>	<b>2.301</b>	<b>0.009</b>	3.585	3.940	0.024	2.628	2.888	0.013	3.833	4.172	0.025	4.897	5.350	0.039
2	1	10.542	11.137	0.128	10.328	10.855	0.127	9.902	10.513	0.110	11.648	12.379	0.148	<b>6.121</b>	<b>6.457</b>	<b>0.063</b>
	2	8.628	9.324	0.101	11.304	12.088	0.167	9.845	10.532	0.124	<b>5.990</b>	<b>6.551</b>	<b>0.057</b>	16.205	17.295	0.334
	3	<b>3.707</b>	<b>4.047</b>	<b>0.023</b>	7.108	7.853	0.095	5.966	6.538	0.063	5.486	5.953	0.046	6.663	7.345	0.082
	4	5.772	6.097	0.080	5.670	5.996	0.047	5.388	5.686	0.046	<b>4.629</b>	<b>4.913</b>	<b>0.038</b>	5.269	5.695	0.048
	5	5.633	6.085	0.079	5.490	6.040	0.052	6.032	6.593	0.053	<b>5.116</b>	<b>5.606</b>	<b>0.044</b>	8.369	9.049	0.090
3	1	<b>13.441</b>	<b>14.599</b>	<b>0.231</b>	19.552	21.576	0.429	20.368	22.381	0.440	21.016	22.966	0.459	20.679	22.687	0.502
	2	10.517	11.062	0.135	11.875	12.522	0.159	13.743	14.541	0.205	17.850	18.907	0.337	<b>8.177</b>	<b>8.643</b>	<b>0.086</b>
	3	10.299	11.013	0.142	8.363	8.851	0.084	7.599	8.042	0.068	5.195	5.522	<b>0.036</b>	<b>4.794</b>	<b>5.135</b>	0.036
	4	5.857	6.345	0.060	6.183	6.583	0.050	6.566	6.968	0.057	8.746	9.267	0.095	<b>3.967</b>	<b>4.269</b>	<b>0.025</b>
	5	9.181	9.792	0.129	<b>5.901</b>	<b>6.373</b>	0.050	6.096	6.570	<b>0.048</b>	17.748	18.916	0.372	6.781	7.343	0.068
4	1	31.859	33.738	1.631	15.003	16.140	0.390	<b>11.408</b>	<b>12.241</b>	<b>0.164</b>	60.077	63.804	4.664	13.605	14.567	0.279
	2	12.158	13.217	0.214	12.641	13.784	0.189	12.550	13.620	0.180	<b>10.529</b>	<b>11.382</b>	<b>0.138</b>	13.881	15.055	0.237
	3	<b>8.506</b>	<b>9.251</b>	<b>0.108</b>	16.641	18.045	0.296	15.810	17.070	0.266	9.687	10.470	0.140	19.946	21.440	0.441
	4	19.688	20.784	0.445	15.108	15.772	0.263	17.563	18.390	0.339	20.519	21.466	0.482	<b>10.488</b>	<b>11.023</b>	<b>0.130</b>
	5	27.700	29.321	0.843	6.257	6.609	<b>0.045</b>	9.003	9.558	0.089	30.656	32.340	1.019	<b>4.654</b>	<b>5.066</b>	0.049
5	1	7.870	8.576	0.111	6.347	7.076	0.087	<b>6.183</b>	<b>6.789</b>	<b>0.063</b>	9.786	10.572	0.110	8.503	9.309	0.116
	2	8.152	8.988	0.122	7.869	8.651	0.093	<b>5.677</b>	<b>6.220</b>	<b>0.050</b>	6.137	6.743	0.059	14.391	15.595	0.257
	3	<b>8.552</b>	<b>9.081</b>	<b>0.092</b>	11.892	12.600	0.168	12.243	12.983	0.170	12.855	13.663	0.185	12.601	13.544	0.225
	4	9.968	10.628	0.217	10.382	10.922	0.129	7.029	7.405	0.063	16.596	17.506	0.295	<b>6.515</b>	<b>6.961</b>	<b>0.063</b>
	5	6.946	7.558	0.100	7.394	7.948	0.071	6.726	7.223	0.057	<b>3.322</b>	<b>3.594</b>	<b>0.019</b>	10.295	11.064	0.141
6	1	8.067	8.509	0.082	<b>2.676</b>	<b>2.900</b>	0.014	2.821	3.006	<b>0.012</b>	3.059	3.261	0.014	5.865	6.300	0.050
	2	10.831	11.426	0.166	8.165	8.585	0.081	5.860	6.171	0.044	6.569	6.951	0.057	<b>4.375</b>	<b>4.685</b>	<b>0.038</b>
	3	<b>8.068</b>	<b>8.755</b>	<b>0.088</b>	11.410	12.212	0.170	12.104	12.911	0.184	12.253	13.093	0.177	14.525	15.611	0.251
	4	8.330	8.819	0.094	9.622	10.119	0.110	8.937	9.365	0.095	9.687	10.148	0.110	<b>5.654</b>	<b>6.010</b>	<b>0.051</b>
	5	8.247	8.871	0.096	3.225	3.580	0.027	<b>2.806</b>	<b>3.070</b>	<b>0.015</b>	3.570	3.869	0.021	6.279	6.787	0.057
7	1	6.864	7.479	0.075	4.613	5.124	0.042	3.905	4.322	0.027	<b>3.122</b>	<b>3.466</b>	<b>0.020</b>	9.671	10.646	0.127
	2	12.822	13.866	0.237	9.915	10.578	0.121	11.559	12.374	0.151	34.755	37.476	1.347	<b>7.234</b>	<b>7.781</b>	<b>0.072</b>
	3	9.830	10.658	0.152	3.459	3.742	0.016	<b>2.884</b>	<b>3.135</b>	<b>0.013</b>	4.710	5.183	0.039	4.134	4.468	0.027
	4	3.748	4.155	0.026	4.341	4.783	0.037	<b>3.123</b>	<b>3.450</b>	<b>0.018</b>	4.606	5.081	0.031	12.716	13.835	0.194
	5	7.486	8.191	0.098	5.150	5.755	0.063	<b>4.219</b>	<b>4.694</b>	<b>0.038</b>	6.733	7.271	0.061	5.870	6.541	0.075
	1	14.929	15.965	0.259	13.224	14.032	0.204	12.706	13.449	0.184	11.698	12.391	0.158	<b>7.168</b>	<b>7.658</b>	<b>0.074</b>
	2	7.683	8.290	0.086	10.973	11.911	0.144	9.813	10.579	0.111	<b>6.562</b>	<b>7.072</b>	<b>0.053</b>	16.346	17.609	0.302

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Model		CNN			LSTM			GRU			MLP			Attention		
Group	Battery	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
	3	6.718	7.268	0.067	5.096	5.553	0.041	3.925	4.259	0.023	<b>3.815</b>	<b>4.126</b>	<b>0.019</b>	8.525	9.246	0.098
	4	17.040	18.058	0.349	16.142	17.045	0.292	18.459	19.561	0.364	20.035	21.244	0.429	<b>7.372</b>	<b>7.830</b>	<b>0.071</b>
	5	15.972	17.274	0.333	14.569	15.861	0.253	17.727	19.204	0.342	17.004	18.356	0.326	<b>12.553</b>	<b>13.672</b>	<b>0.228</b>
9	1	6.594	7.203	0.092	<b>5.309</b>	<b>5.727</b>	<b>0.037</b>	6.569	7.098	0.050	6.324	6.942	0.102	6.786	7.429	0.082
	2	10.876	11.558	0.142	11.733	12.434	0.157	13.484	14.278	0.205	18.935	20.055	0.399	<b>5.140</b>	<b>5.557</b>	<b>0.058</b>
	3	9.402	10.140	0.162	5.405	5.847	0.049	<b>4.471</b>	<b>4.823</b>	<b>0.033</b>	38.017	40.387	1.616	5.871	6.365	0.056
	4	<b>4.485</b>	<b>4.917</b>	<b>0.041</b>	6.249	6.872	0.060	7.420	8.052	0.063	6.528	7.092	0.060	8.834	9.573	0.093
	5	15.319	16.273	0.280	7.967	8.612	0.093	<b>6.255</b>	<b>6.776</b>	0.060	30.935	32.724	1.051	6.283	6.801	<b>0.060</b>

**Note:** (1). All values are the average value of 3 experiments; (2). For intuitive display, all values have been magnified 1000 times.

Table C.4: The results of Toyota-MIT-Stanford dataset, the input type is complete charging data with  $[0, 1]$  normalization. The best result was **bolded**.

Model		CNN			LSTM			GRU			MLP			Attention		
Group	Battery	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
1	1	<b>4.320</b>	<b>4.866</b>	<b>0.043</b>	10.067	11.707	0.467	9.316	10.752	0.411	7.345	8.527	0.293	8.139	9.498	0.373
	2	<b>6.412</b>	<b>6.924</b>	<b>0.055</b>	13.631	14.860	0.285	13.785	14.973	0.264	11.162	12.165	0.160	9.074	9.983	0.142
	3	40.948	43.823	3.069	14.305	15.674	0.332	13.411	14.692	0.286	13.146	14.372	<b>0.228</b>	<b>12.488</b>	<b>13.680</b>	0.229
	4	41.696	45.207	2.540	7.618	8.734	0.203	7.216	8.166	0.150	6.127	6.822	<b>0.082</b>	<b>4.399</b>	<b>5.106</b>	0.108
	5	20.500	22.073	0.537	<b>12.384</b>	<b>14.309</b>	0.591	18.681	20.971	0.684	14.145	16.100	0.532	14.148	15.969	<b>0.516</b>
2	1	77.764	82.392	8.020	28.063	30.686	1.303	18.999	20.985	0.726	<b>9.795</b>	<b>10.988</b>	<b>0.292</b>	19.953	22.055	0.818
	2	17.686	19.110	<b>0.447</b>	18.850	21.399	1.051	18.901	21.101	0.677	22.075	24.180	0.633	<b>14.623</b>	<b>16.370</b>	0.518
	3	23.847	25.766	0.613	17.976	20.504	1.090	21.216	23.680	0.842	<b>15.296</b>	<b>16.792</b>	<b>0.335</b>	15.427	17.394	0.618
	4	14.858	15.720	0.328	28.506	30.795	1.233	22.623	24.256	0.697	<b>8.829</b>	<b>9.531</b>	<b>0.156</b>	17.474	18.942	0.493
	5	24.551	25.994	0.828	26.319	28.281	0.941	27.490	29.232	0.913	29.883	31.647	0.936	<b>21.655</b>	<b>23.169</b>	<b>0.646</b>
3	1	10.519	11.524	0.187	<b>5.152</b>	<b>5.829</b>	0.107	5.595	6.266	<b>0.100</b>	19.381	21.104	0.511	13.248	14.519	0.258
	2	21.840	23.591	1.018	11.966	13.440	0.374	9.396	10.619	<b>0.282</b>	<b>9.168</b>	<b>10.404</b>	0.284	10.254	11.741	0.380
	3	<b>3.684</b>	<b>4.030</b>	<b>0.026</b>	10.577	11.618	0.183	10.636	11.651	0.165	9.391	10.338	0.129	6.720	7.489	0.115
	4	<b>7.414</b>	<b>8.105</b>	<b>0.122</b>	11.526	12.614	0.225	8.398	9.248	0.146	8.825	9.669	0.130	8.654	9.441	0.132
	5	19.329	20.896	0.506	13.077	14.683	0.392	14.195	15.778	0.382	13.232	14.669	0.315	<b>10.535</b>	<b>11.790</b>	<b>0.261</b>
4	1	<b>5.634</b>	<b>6.022</b>	<b>0.057</b>	13.430	14.669	0.327	11.870	12.978	0.267	8.621	9.399	0.168	9.917	10.833	0.234
	2	<b>3.935</b>	<b>4.321</b>	<b>0.033</b>	5.459	6.221	0.120	4.713	5.310	0.084	5.059	5.632	0.062	5.288	5.922	0.101
	3	10.490	11.426	0.214	9.341	10.274	0.146	10.162	11.117	0.163	8.840	9.757	0.144	<b>8.508</b>	<b>9.401</b>	<b>0.135</b>
	4	6.354	6.851	<b>0.073</b>	7.191	8.071	0.201	6.287	7.058	0.166	<b>4.385</b>	<b>4.944</b>	0.097	5.674	6.368	0.160
	5	<b>4.464</b>	<b>4.837</b>	<b>0.033</b>	8.977	10.111	0.262	10.038	11.157	0.251	8.005	8.852	0.165	8.318	9.198	0.179
5	1	14.067	15.141	0.296	18.341	20.400	0.762	17.452	19.360	0.643	14.459	15.685	<b>0.282</b>	<b>12.416</b>	<b>13.736</b>	0.335
	2	31.489	33.475	1.503	26.570	28.767	1.043	25.944	28.035	0.962	<b>9.290</b>	<b>10.233</b>	<b>0.255</b>	13.550	14.863	0.406
	3	9.226	10.043	<b>0.138</b>	21.736	24.024	0.949	21.667	23.781	0.795	<b>6.743</b>	<b>7.541</b>	0.152	16.029	17.663	0.490
	4	73.451	79.313	8.175	17.763	20.114	0.933	21.519	23.864	0.819	49.489	53.187	2.631	<b>16.127</b>	<b>17.747</b>	<b>0.482</b>
	5	26.859	28.826	1.096	<b>20.823</b>	<b>23.117</b>	<b>1.006</b>	80.604	87.002	6.968	87.831	94.374	7.953	30.526	33.320	1.460
6	1	7.276	7.941	<b>0.107</b>	11.980	13.093	0.283	10.109	11.063	0.212	<b>5.482</b>	<b>6.112</b>	0.128	7.091	7.919	0.204
	2	<b>6.411</b>	<b>6.847</b>	<b>0.071</b>	16.012	17.104	0.367	13.977	14.963	0.294	14.216	15.174	0.292	9.820	10.577	0.199
	3	16.619	18.064	0.559	7.044	7.962	0.172	6.884	7.627	0.117	7.337	8.130	0.112	<b>5.881</b>	<b>6.537</b>	<b>0.088</b>
	4	<b>5.254</b>	<b>5.652</b>	<b>0.054</b>	7.656	8.492	0.194	8.446	9.257	0.186	8.145	8.935	0.193	5.735	6.450	0.176
	5	36.256	39.241	2.059	6.100	6.979	0.173	5.925	6.674	0.131	5.890	6.528	<b>0.099</b>	<b>5.648</b>	<b>6.399</b>	0.143
7	1	10.066	10.888	<b>0.145</b>	18.788	20.188	0.405	18.510	19.883	0.394	17.533	18.841	0.363	<b>9.218</b>	<b>10.032</b>	0.149
	2	11.293	12.466	0.264	16.854	18.793	0.434	17.463	19.322	0.401	15.798	17.262	0.304	<b>10.895</b>	<b>12.152</b>	<b>0.230</b>
	3	8.855	9.556	<b>0.096</b>	12.312	13.532	0.237	11.549	12.625	0.189	17.372	18.828	0.342	<b>8.500</b>	<b>9.386</b>	0.145
	4	<b>6.667</b>	<b>7.253</b>	<b>0.086</b>	9.354	10.480	0.279	6.797	7.721	0.216	7.170	8.156	0.237	8.747	9.740	0.240
	5	7.894	8.639	0.091	6.435	7.357	0.153	5.777	6.511	0.108	<b>3.401</b>	<b>3.871</b>	<b>0.058</b>	4.640	5.210	0.062
8	1	<b>9.319</b>	<b>10.263</b>	<b>0.129</b>	22.708	25.235	0.632	22.949	25.340	0.605	15.880	17.528	0.326	11.973	13.240	0.222
	2	39.998	42.446	2.215	15.783	17.029	0.363	13.957	15.074	0.291	5.994	6.612	<b>0.123</b>	<b>5.572</b>	<b>6.235</b>	0.149
	3	10.668	11.490	0.215	10.654	11.708	0.255	7.635	8.486	0.184	<b>5.052</b>	<b>5.687</b>	<b>0.127</b>	5.804	6.549	0.149
	4	9.071	9.933	0.217	7.338	8.258	0.229	7.005	7.860	0.199	14.227	15.295	0.258	<b>6.391</b>	<b>7.045</b>	<b>0.125</b>
	5	13.649	14.706	0.220	<b>11.184</b>	<b>12.221</b>	<b>0.196</b>	12.330	13.445	0.209	19.146	20.870	0.488	14.041	15.376	0.331
9	1	7.919	8.636	<b>0.084</b>	8.312	9.561	0.284	8.530	9.608	0.213	<b>5.843</b>	<b>6.532</b>	0.103	7.134	7.945	0.136
	2	33.203	36.032	1.993	29.117	31.548	0.952	24.152	26.221	0.642	27.454	29.825	1.022	<b>19.685</b>	<b>21.535</b>	<b>0.527</b>
	3	<b>5.894</b>	<b>6.409</b>	<b>0.076</b>	13.363	14.859	0.460	10.130	11.349	0.339	7.729	8.698	0.251	12.013	13.525	0.483

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Model		CNN			LSTM			GRU			MLP			Attention		
Group	Battery	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
	4	<b>7.245</b>	<b>7.833</b>	<b>0.086</b>	13.580	14.928	0.382	9.192	10.213	0.243	7.698	8.436	0.157	10.847	12.066	0.343
	5	33.145	35.498	2.617	9.742	11.063	0.346	8.729	9.885	0.265	<b>5.714</b>	<b>6.536</b>	<b>0.163</b>	8.205	9.243	0.239

**Note:** (1). All values are the average value of 3 experiments; (2). For intuitive display, all values have been magnified 1000 times.

Table C.5: The results of Toyota-MIT-Stanford dataset, the input type is partial charging data with  $[0, 1]$  normalization. The best result was **bolded**.

Model		CNN			LSTM			GRU			MLP			Attention		
Group	Battery	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
1	1	<b>3.219</b>	<b>3.492</b>	<b>0.023</b>	5.043	5.453	0.064	4.855	5.275	0.057	8.567	9.247	0.101	4.550	4.987	0.056
	2	41.464	43.776	2.688	15.044	15.850	0.271	14.808	15.690	0.247	8.866	9.465	0.120	<b>7.287</b>	<b>7.832</b>	<b>0.093</b>
	3	14.747	15.760	0.644	9.347	10.356	0.171	9.614	10.530	0.133	<b>3.568</b>	<b>3.951</b>	<b>0.057</b>	7.008	7.613	0.076
	4	8.320	8.842	0.140	12.356	13.051	0.202	11.056	11.747	0.151	<b>3.953</b>	<b>4.315</b>	<b>0.046</b>	7.961	8.492	0.094
	5	11.705	12.623	0.275	13.794	15.072	0.245	13.324	14.514	0.216	7.618	8.340	0.106	<b>6.744</b>	<b>7.392</b>	<b>0.086</b>
2	1	82.406	87.384	7.181	9.724	10.775	0.321	<b>8.626</b>	<b>9.546</b>	<b>0.266</b>	15.544	16.878	0.423	10.931	12.025	0.272
	2	36.091	39.217	2.091	12.522	13.841	0.296	14.929	16.309	0.314	11.889	13.144	0.274	<b>11.830</b>	<b>13.027</b>	<b>0.230</b>
	3	30.044	32.432	1.213	13.551	14.801	0.252	14.828	16.088	0.278	12.492	13.683	0.233	<b>12.087</b>	<b>13.136</b>	<b>0.200</b>
	4	74.349	78.363	5.898	12.726	13.614	0.256	14.450	15.440	0.280	<b>9.949</b>	<b>10.754</b>	<b>0.188</b>	11.961	12.812	0.201
	5	46.889	49.760	2.663	14.064	15.043	0.284	11.829	12.658	0.197	15.317	16.210	0.289	<b>9.613</b>	<b>10.320</b>	<b>0.133</b>
3	1	4.581	<b>5.076</b>	<b>0.043</b>	6.744	7.652	0.146	10.350	11.457	0.177	<b>4.535</b>	5.098	0.077	6.787	7.492	0.096
	2	14.157	15.411	0.313	17.459	19.012	0.466	17.212	18.647	0.367	31.266	33.811	1.086	<b>8.624</b>	<b>9.423</b>	<b>0.121</b>
	3	17.000	17.978	0.558	9.481	10.261	0.198	8.103	8.835	0.164	<b>7.689</b>	<b>8.366</b>	<b>0.115</b>	11.453	12.274	0.189
	4	<b>4.967</b>	<b>5.310</b>	<b>0.043</b>	9.009	9.698	0.163	8.262	8.909	0.125	6.120	6.603	0.085	8.059	8.620	0.106
	5	50.866	54.763	2.875	10.261	11.288	0.212	11.318	12.392	0.217	11.925	12.930	0.203	<b>6.789</b>	<b>7.470</b>	<b>0.113</b>
4	1	34.602	37.766	2.129	15.587	17.378	0.341	15.784	17.518	0.309	11.533	12.937	0.215	<b>7.274</b>	<b>8.122</b>	<b>0.090</b>
	2	<b>2.658</b>	<b>2.857</b>	<b>0.012</b>	11.078	11.789	0.159	10.481	11.205	0.144	5.034	5.528	0.074	6.210	6.704	0.081
	3	4.646	4.963	<b>0.041</b>	8.729	9.330	0.110	7.772	8.370	0.094	3.984	4.428	0.050	<b>3.530</b>	<b>3.916</b>	0.048
	4	34.660	37.018	2.118	6.310	6.878	0.106	<b>4.491</b>	<b>4.954</b>	<b>0.073</b>	13.610	14.542	0.225	12.164	13.160	0.233
	5	32.646	34.906	1.731	5.467	6.038	0.071	4.284	4.792	0.056	<b>2.967</b>	<b>3.342</b>	<b>0.038</b>	4.255	4.682	0.047
5	1	7.032	7.755	0.109	6.021	6.979	0.166	5.789	6.730	0.150	5.592	6.343	0.080	<b>3.779</b>	<b>4.347</b>	<b>0.072</b>
	2	27.862	29.815	1.482	6.414	6.981	0.068	7.436	8.092	0.087	7.280	7.882	0.083	<b>2.887</b>	<b>3.233</b>	<b>0.032</b>
	3	64.025	68.688	4.318	4.939	5.454	0.070	4.295	4.734	0.056	<b>3.723</b>	<b>4.112</b>	<b>0.034</b>	4.014	4.408	0.039
	4	<b>5.291</b>	<b>5.860</b>	0.068	6.304	7.156	0.111	6.735	7.603	0.104	5.554	6.209	<b>0.058</b>	6.025	6.829	0.102
	5	<b>4.625</b>	<b>5.069</b>	<b>0.032</b>	14.401	15.765	0.377	9.052	10.028	0.199	6.098	6.710	0.076	8.396	9.221	0.137
6	1	<b>5.569</b>	<b>5.932</b>	<b>0.065</b>	11.698	12.447	0.170	11.219	11.996	0.155	10.878	11.634	0.175	5.928	6.437	0.070
	2	40.812	43.654	2.683	7.692	8.513	0.107	7.949	8.724	0.093	<b>3.395</b>	<b>3.788</b>	<b>0.046</b>	4.512	4.981	0.048
	3	5.759	6.290	<b>0.067</b>	11.081	12.410	0.268	<b>5.236</b>	<b>5.898</b>	0.095	6.055	6.669	0.096	5.344	5.960	0.083
	4	19.858	21.129	0.987	4.951	5.359	0.054	3.840	4.191	0.043	3.268	3.634	<b>0.042</b>	<b>2.903</b>	<b>3.225</b>	0.042
	5	4.110	4.434	<b>0.027</b>	<b>3.624</b>	<b>4.082</b>	0.061	3.972	4.431	0.053	4.691	5.193	0.062	4.694	5.261	0.084
7	1	17.434	18.880	0.508	11.994	13.321	0.325	11.645	12.891	0.291	6.252	6.858	<b>0.084</b>	<b>5.155</b>	<b>5.798</b>	0.103
	2	38.633	41.055	2.264	20.559	22.094	0.576	19.344	20.794	0.535	<b>13.005</b>	<b>13.969</b>	0.352	14.547	15.657	<b>0.271</b>
	3	40.143	43.030	1.786	15.897	17.474	0.460	14.953	16.366	0.385	<b>6.515</b>	<b>7.142</b>	<b>0.089</b>	7.267	8.033	0.153
	4	54.875	59.187	4.341	21.245	23.337	0.711	24.641	26.905	0.891	42.223	45.252	2.048	<b>12.205</b>	<b>13.306</b>	<b>0.210</b>
	5	38.229	40.729	2.923	49.061	53.001	2.788	105.079	112.303	11.209	110.464	117.712	12.398	<b>17.480</b>	<b>19.326</b>	<b>0.692</b>
8	1	<b>4.483</b>	<b>4.801</b>	<b>0.029</b>	9.651	10.337	0.138	9.318	10.012	0.113	7.078	7.686	0.089	11.020	11.883	0.167
	2	20.203	21.988	1.005	11.402	12.645	0.194	11.983	13.199	0.185	7.997	8.788	0.110	<b>6.157</b>	<b>6.848</b>	<b>0.088</b>
	3	28.494	30.552	1.328	4.295	4.783	0.062	<b>2.598</b>	<b>2.888</b>	<b>0.036</b>	4.089	4.548	0.050	3.676	4.074	0.042
	4	12.599	13.486	0.332	11.529	12.348	0.166	10.815	11.723	0.161	<b>3.760</b>	<b>4.290</b>	<b>0.094</b>	9.865	10.603	0.125
	5	55.107	59.622	4.633	9.854	10.970	0.164	8.646	9.552	0.110	<b>3.804</b>	<b>4.255</b>	0.056	4.365	4.837	<b>0.046</b>
9	1	7.785	8.486	0.099	9.069	10.049	0.126	9.330	10.276	0.110	<b>5.151</b>	<b>5.717</b>	<b>0.057</b>	6.786	7.434	0.073
	2	8.503	9.270	0.179	8.828	9.656	0.154	6.995	7.699	0.114	<b>3.986</b>	<b>4.502</b>	<b>0.058</b>	5.223	5.922	0.119
	3	6.644	7.218	0.064	4.045	4.558	0.054	<b>3.592</b>	<b>4.076</b>	<b>0.048</b>	6.303	6.961	0.068	4.429	4.961	0.056
	4	48.612	51.875	3.445	11.689	12.534	0.200	11.894	12.758	0.192	15.880	16.989	0.333	<b>7.861</b>	<b>8.474</b>	<b>0.140</b>
	5	<b>3.179</b>	<b>3.480</b>	<b>0.018</b>	3.608	4.116	0.078	3.619	4.131	0.070	4.485	5.030	0.060	4.898	5.451	0.075

**Note:** (1). All values are the average value of 3 experiments; (2). For intuitive display, all values have been magnified 1000 times.

Table C.6: The results of Toyota-MIT-Stanford dataset, the input type is handcraft features with  $[0, 1]$  normalization. The best result was **bolded**.

Model		CNN			LSTM			GRU			MLP			Attention		
Group	Battery	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
1	1	6.244	7.044	0.148	6.851	7.540	0.069	<b>4.576</b>	<b>4.981</b>	<b>0.032</b>	7.611	8.336	0.088	8.851	9.719	0.113
	2	17.390	18.467	0.616	5.946	6.495	0.060	5.345	5.787	0.041	5.915	6.405	0.048	<b>4.137</b>	<b>4.564</b>	<b>0.034</b>
	3	20.510	22.145	0.882	<b>6.897</b>	<b>7.494</b>	<b>0.063</b>	9.770	10.557	0.110	10.144	11.140	0.160	11.143	11.963	0.161
	4	<b>4.876</b>	<b>5.204</b>	<b>0.033</b>	10.408	11.124	0.135	8.236	8.800	0.086	7.884	8.401	0.079	6.972	7.580	0.077
	5	4.853	5.250	0.035	5.291	5.811	0.047	4.852	5.259	0.034	15.295	16.323	0.298	<b>3.756</b>	<b>4.137</b>	<b>0.027</b>
2	1	8.900	9.385	0.111	12.046	12.647	0.175	11.764	12.403	0.157	17.061	17.990	0.342	<b>5.698</b>	<b>6.012</b>	<b>0.045</b>
	2	17.422	18.826	0.530	<b>12.782</b>	<b>13.751</b>	<b>0.206</b>	14.202	15.147	0.250	15.782	16.823	0.303	13.275	14.189	0.224
	3	<b>4.383</b>	<b>4.776</b>	<b>0.034</b>	7.797	8.657	0.120	7.082	7.756	0.078	10.182	10.935	0.138	6.704	7.369	0.081
	4	5.434	5.846	0.053	6.629	7.026	0.062	5.403	5.700	0.048	5.402	5.835	0.056	<b>3.732</b>	<b>3.984</b>	<b>0.023</b>
	5	11.057	11.877	0.258	5.693	6.325	0.070	7.258	7.985	0.094	10.766	11.847	0.231	<b>4.176</b>	<b>4.572</b>	<b>0.033</b>
3	1	24.653	26.876	0.902	<b>18.701</b>	<b>20.696</b>	0.409	19.802	21.771	0.424	21.170	23.063	0.490	19.157	21.031	<b>0.405</b>
	2	25.015	26.464	0.942	12.835	13.516	0.191	13.952	14.712	0.222	21.256	22.502	0.505	<b>8.150</b>	<b>8.615</b>	<b>0.085</b>
	3	12.170	13.008	0.266	7.785	8.260	0.082	5.932	6.277	0.050	9.383	10.212	0.149	<b>5.666</b>	<b>6.031</b>	<b>0.044</b>
	4	26.554	28.296	1.658	6.433	6.867	0.057	6.423	6.820	0.056	8.929	9.477	0.110	<b>3.495</b>	<b>3.771</b>	<b>0.021</b>
	5	8.382	9.143	0.163	<b>6.156</b>	<b>6.658</b>	<b>0.055</b>	6.760	7.316	0.065	21.270	22.770	0.497	6.711	7.270	0.065
4	1	60.360	64.034	4.022	16.358	17.591	0.435	<b>12.127</b>	<b>13.043</b>	<b>0.206</b>	22.098	23.348	0.676	15.501	16.664	0.399
	2	35.046	37.980	1.627	<b>11.324</b>	12.407	0.167	11.367	<b>12.347</b>	<b>0.152</b>	19.023	20.503	0.424	12.483	13.521	0.193
	3	37.237	40.175	1.556	<b>15.907</b>	17.313	0.280	15.950	<b>17.279</b>	<b>0.278</b>	17.387	18.891	0.403	20.286	21.903	0.443
	4	76.862	80.935	6.120	15.376	16.076	0.271	19.564	20.454	0.431	37.692	39.421	1.609	<b>9.448</b>	<b>9.972</b>	<b>0.116</b>
	5	73.601	78.007	5.484	5.689	6.001	0.040	7.225	7.680	0.062	14.679	15.567	0.293	<b>3.645</b>	<b>3.901</b>	<b>0.026</b>
5	1	7.263	7.821	0.104	6.872	7.669	0.103	<b>5.012</b>	<b>5.534</b>	<b>0.048</b>	22.397	24.111	0.573	7.203	7.976	0.098
	2	23.715	25.771	1.262	8.504	9.409	0.116	<b>4.797</b>	<b>5.308</b>	<b>0.046</b>	13.452	14.678	0.265	9.530	10.366	0.123
	3	32.725	34.738	2.521	11.788	12.485	0.158	12.132	12.839	0.170	13.568	14.370	0.243	<b>7.615</b>	<b>8.137</b>	<b>0.088</b>
	4	64.517	68.516	4.328	10.705	11.279	0.136	<b>4.699</b>	<b>5.014</b>	<b>0.034</b>	28.721	30.444	0.882	7.082	7.502	0.075
	5	47.106	50.586	2.325	7.771	8.371	0.079	<b>7.602</b>	<b>8.162</b>	<b>0.074</b>	12.930	14.120	0.278	10.101	10.828	0.130
6	1	24.162	25.736	0.644	<b>3.552</b>	<b>3.868</b>	0.026	4.156	4.438	<b>0.025</b>	9.933	10.500	0.118	4.821	5.167	0.035
	2	42.929	45.264	2.752	9.885	10.405	0.117	5.782	6.075	0.043	4.626	4.920	0.038	<b>3.784</b>	<b>4.029</b>	<b>0.022</b>
	3	10.761	11.557	<b>0.143</b>	<b>10.723</b>	<b>11.528</b>	0.158	12.122	12.948	0.181	12.513	13.623	0.199	12.708	13.571	0.199
	4	<b>8.026</b>	<b>8.490</b>	<b>0.086</b>	9.763	10.303	0.119	8.845	9.284	0.095	8.711	9.165	0.097	8.236	8.700	0.097
	5	<b>3.450</b>	<b>3.777</b>	<b>0.022</b>	4.427	4.923	0.049	4.421	4.821	0.034	15.330	16.427	0.289	7.581	8.231	0.083
7	1	29.871	32.531	1.581	<b>5.551</b>	<b>6.229</b>	0.066	6.095	6.674	<b>0.052</b>	11.985	12.869	0.194	11.482	12.514	0.164
	2	33.415	35.949	1.658	10.025	10.701	0.130	12.353	13.190	0.181	24.760	26.671	0.655	<b>6.381</b>	<b>6.892</b>	<b>0.067</b>
	3	19.219	20.668	0.795	<b>3.678</b>	<b>3.985</b>	<b>0.020</b>	3.905	4.202	0.022	14.127	15.208	0.238	4.552	4.973	0.037
	4	31.011	33.698	1.072	4.660	5.191	0.050	<b>4.272</b>	<b>4.726</b>	<b>0.032</b>	9.163	10.157	0.129	7.931	8.618	0.097
	5	5.385	6.018	0.065	5.893	6.620	0.087	<b>4.717</b>	<b>5.247</b>	<b>0.048</b>	10.577	11.502	0.162	5.339	6.002	0.068
8	1	20.158	21.454	0.751	13.953	14.835	0.227	14.969	15.881	0.257	17.611	18.729	0.438	<b>8.992</b>	<b>9.586</b>	<b>0.104</b>
	2	<b>10.555</b>	<b>11.392</b>	<b>0.132</b>	11.479	12.525	0.165	11.879	12.818	0.164	16.274	17.520	0.322	15.932	17.225	0.291
	3	28.843	30.962	1.209	6.134	6.709	0.065	3.663	3.998	<b>0.022</b>	<b>3.620</b>	<b>3.934</b>	0.024	9.188	9.907	0.104
	4	31.903	33.932	1.306	15.336	16.204	0.267	14.795	15.660	0.244	<b>11.217</b>	<b>12.037</b>	<b>0.169</b>	12.170	12.849	0.173
	5	22.758	24.608	0.627	<b>12.275</b>	<b>13.443</b>	<b>0.202</b>	15.502	16.820	0.274	16.613	17.969	0.323	18.264	19.822	0.384
9	1	56.913	61.206	3.375	4.258	4.627	0.029	<b>3.008</b>	<b>3.276</b>	<b>0.016</b>	48.771	52.481	2.447	10.045	10.821	0.115
	2	42.321	44.917	2.178	12.802	13.561	0.184	12.871	13.617	0.191	31.238	33.024	1.089	<b>4.976</b>	<b>5.373</b>	<b>0.045</b>
	3	27.511	29.400	1.011	6.338	6.887	0.069	<b>4.576</b>	<b>4.954</b>	<b>0.036</b>	8.971	9.762	0.134	4.878	5.269	0.039
	4	28.173	30.407	1.218	<b>6.373</b>	<b>7.053</b>	0.075	7.017	7.659	<b>0.061</b>	6.686	7.320	0.083	11.083	12.032	0.143
	5	42.004	44.597	1.861	8.326	9.027	0.106	<b>4.768</b>	<b>5.282</b>	<b>0.060</b>	48.795	51.975	2.506	6.036	6.534	0.062

**Note:** (1). All values are the average value of 3 experiments; (2). For intuitive display, all values have been magnified 1000 times.

Table C.7: The results of Toyota-MIT-Stanford dataset, the input type is complete charging data with z-score normalization. The best result was **bolded**.

Model		CNN			LSTM			GRU			MLP			Attention		
Group	Battery	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
1	1	13.200	14.188	0.316	30.406	34.061	1.476	29.253	33.042	1.542	<b>2.749</b>	<b>3.046</b>	<b>0.042</b>	11.257	12.265	0.170
	2	20.376	22.049	0.772	25.251	28.190	1.274	27.534	30.433	1.256	<b>6.243</b>	<b>6.741</b>	<b>0.055</b>	8.249	9.011	0.115
	3	6.711	7.283	0.078	22.896	25.507	1.137	25.359	27.932	1.114	<b>6.174</b>	<b>6.682</b>	<b>0.069</b>	8.800	9.599	0.158
	4	11.997	13.161	0.293	25.202	28.393	1.238	25.463	28.680	1.255	<b>3.384</b>	<b>3.748</b>	<b>0.045</b>	6.216	6.858	0.063

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Model		CNN			LSTM			GRU			MLP			Attention		
Group	Battery	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
	5	17.988	19.672	0.799	41.013	44.535	2.109	53.135	56.883	3.254	<b>8.527</b>	<b>9.457</b>	<b>0.150</b>	26.162	28.112	1.169
2	1	39.002	41.646	1.966	30.332	33.051	1.429	29.324	32.033	1.403	23.429	25.363	0.688	<b>16.525</b>	<b>17.800</b>	<b>0.397</b>
	2	<b>17.689</b>	<b>19.303</b>	0.603	18.167	20.704	1.096	17.711	20.142	0.995	19.710	21.379	<b>0.553</b>	21.002	22.745	0.655
	3	24.031	25.888	0.914	19.686	22.433	1.271	18.523	21.170	1.215	<b>6.883</b>	<b>7.648</b>	<b>0.128</b>	18.310	19.906	0.458
	4	15.492	16.407	0.368	30.988	33.389	1.393	29.656	32.045	1.341	25.157	26.429	0.669	<b>14.338</b>	<b>15.192</b>	<b>0.324</b>
	5	35.643	37.704	1.850	22.681	24.781	0.999	23.202	25.301	1.001	<b>11.063</b>	<b>11.958</b>	<b>0.237</b>	30.814	33.111	1.603
3	1	38.486	41.568	1.980	25.753	29.041	1.445	31.682	35.496	1.852	14.383	15.691	0.272	<b>11.647</b>	<b>12.635</b>	<b>0.210</b>
	2	6.596	7.187	0.085	31.621	34.696	1.449	27.836	30.901	1.350	<b>4.645</b>	<b>5.103</b>	<b>0.038</b>	8.669	9.422	0.135
	3	22.563	24.790	0.971	22.929	25.499	1.007	22.843	25.425	1.015	<b>4.140</b>	<b>4.590</b>	<b>0.064</b>	8.379	9.076	0.112
	4	19.956	21.222	0.745	28.469	31.229	1.337	30.189	32.994	1.413	<b>8.101</b>	<b>8.873</b>	<b>0.134</b>	10.759	11.529	0.231
	5	8.072	8.829	0.160	28.300	31.199	1.283	24.167	26.917	1.097	<b>7.058</b>	<b>7.788</b>	<b>0.109</b>	15.939	17.380	0.659
4	1	20.149	21.365	0.642	15.179	16.741	0.541	28.050	30.570	1.283	12.151	12.859	0.204	<b>4.441</b>	<b>4.763</b>	<b>0.032</b>
	2	15.269	16.661	0.386	31.229	33.866	1.247	28.174	31.399	1.407	27.801	29.844	0.856	<b>11.040</b>	<b>11.917</b>	<b>0.189</b>
	3	24.988	26.662	1.577	<b>19.577</b>	<b>22.169</b>	1.057	27.854	30.544	1.217	23.156	24.808	0.788	20.848	22.584	<b>0.625</b>
	4	10.596	11.400	0.275	15.898	16.966	0.302	29.533	31.943	1.226	5.804	6.258	0.083	<b>4.999</b>	<b>5.472</b>	<b>0.050</b>
	5	8.967	9.747	0.228	13.547	14.508	0.264	33.823	36.394	1.378	<b>4.060</b>	<b>4.434</b>	0.060	5.539	5.996	<b>0.047</b>
5	1	<b>11.439</b>	<b>12.405</b>	<b>0.257</b>	18.051	20.336	0.987	17.089	19.195	0.837	13.908	14.952	0.322	17.082	18.492	0.412
	2	34.989	37.254	1.538	27.016	29.254	1.083	25.809	28.017	1.043	18.653	19.732	0.475	<b>7.137</b>	<b>7.679</b>	<b>0.086</b>
	3	29.823	31.799	1.125	21.775	24.115	0.996	21.591	23.926	0.991	14.416	15.621	0.355	<b>7.159</b>	<b>7.829</b>	<b>0.101</b>
	4	30.769	33.235	1.988	19.549	21.993	0.940	18.669	21.071	0.944	<b>15.132</b>	<b>16.302</b>	<b>0.324</b>	16.874	18.320	0.680
	5	56.370	60.238	4.688	25.795	28.238	1.143	24.832	27.237	1.101	<b>19.853</b>	<b>21.163</b>	<b>0.583</b>	23.647	25.748	1.353
6	1	9.018	9.644	0.219	24.126	26.529	1.138	24.665	27.081	1.160	6.672	7.174	0.111	<b>4.526</b>	<b>4.832</b>	<b>0.033</b>
	2	32.910	34.830	1.544	33.622	35.806	1.458	31.435	33.825	1.460	<b>6.868</b>	<b>7.400</b>	<b>0.136</b>	11.100	11.705	0.273
	3	16.145	17.499	0.515	20.269	22.939	1.202	20.624	23.286	1.189	<b>9.569</b>	10.593	0.217	9.787	<b>10.586</b>	<b>0.128</b>
	4	26.772	28.368	0.957	29.596	31.729	1.261	28.841	31.165	1.301	<b>7.049</b>	<b>7.516</b>	<b>0.081</b>	11.193	12.194	0.277
	5	7.381	8.125	0.146	21.967	24.899	1.397	20.192	22.787	1.109	<b>6.264</b>	<b>6.816</b>	0.087	7.732	8.359	<b>0.081</b>
7	1	<b>7.903</b>	<b>8.412</b>	<b>0.115</b>	26.687	29.212	1.179	29.206	31.816	1.291	11.494	12.318	0.201	14.289	15.375	0.302
	2	9.378	10.212	0.123	21.329	24.101	1.069	21.068	23.816	1.051	9.485	10.314	0.161	<b>8.829</b>	<b>9.638</b>	<b>0.099</b>
	3	<b>7.819</b>	<b>8.413</b>	<b>0.137</b>	22.302	24.991	1.144	23.914	26.573	1.113	13.699	14.836	0.253	21.737	23.662	0.782
	4	<b>22.299</b>	<b>24.036</b>	<b>0.730</b>	63.161	66.712	4.711	76.852	81.238	6.778	63.623	68.318	4.227	22.391	24.472	0.936
	5	<b>5.687</b>	<b>6.238</b>	<b>0.072</b>	21.444	24.118	1.015	21.962	24.722	1.084	8.066	8.788	0.183	11.672	12.699	0.249
8	1	22.505	24.749	0.939	25.023	28.054	1.074	24.193	26.915	0.970	<b>9.320</b>	<b>10.310</b>	<b>0.146</b>	15.284	16.854	0.319
	2	4.168	4.469	<b>0.024</b>	22.324	24.173	0.808	28.723	31.080	1.237	<b>3.709</b>	<b>4.089</b>	0.040	9.195	9.898	0.123
	3	12.502	13.333	0.391	24.560	26.525	0.891	28.896	31.268	1.244	<b>4.140</b>	<b>4.529</b>	<b>0.067</b>	6.879	7.403	0.082
	4	8.110	8.878	0.167	16.919	18.117	0.387	24.502	26.391	1.021	<b>5.545</b>	<b>6.001</b>	<b>0.054</b>	22.468	24.503	1.105
	5	25.084	26.794	0.938	36.160	39.962	2.114	66.528	72.411	4.928	<b>11.154</b>	<b>12.188</b>	<b>0.227</b>	22.506	24.468	0.657
9	1	16.540	18.030	0.524	22.123	25.172	1.387	24.354	27.285	1.255	<b>7.776</b>	<b>8.689</b>	0.153	9.414	10.197	<b>0.149</b>
	2	42.697	46.303	2.440	19.893	22.693	1.139	20.395	23.308	1.235	<b>11.032</b>	<b>12.005</b>	<b>0.266</b>	18.302	19.914	0.543
	3	<b>8.944</b>	<b>9.604</b>	0.165	34.217	36.911	1.568	31.087	33.767	1.459	9.875	10.932	0.259	8.996	9.643	<b>0.125</b>
	4	12.425	13.325	0.241	29.787	32.377	1.365	30.837	33.521	1.469	<b>4.735</b>	<b>5.169</b>	<b>0.044</b>	7.220	7.612	0.082
	5	14.033	15.125	0.301	21.264	23.667	0.941	22.254	24.812	1.077	<b>5.646</b>	<b>6.235</b>	<b>0.096</b>	16.047	17.582	0.393

**Note:** (1). All values are the average value of 3 experiments; (2). For intuitive display, all values have been magnified 1000 times.

Table C.8: The results of Toyota-MIT-Stanford dataset, the input type is partial charging data with z-score normalization. The best result was **bolded**.

Model		CNN			LSTM			GRU			MLP			Attention		
Group	Battery	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
1	1	18.260	19.377	0.677	6.446	6.918	0.069	6.233	6.734	<b>0.062</b>	6.081	6.547	0.070	<b>5.992</b>	<b>6.483</b>	0.074
	2	25.595	27.148	0.962	14.995	15.850	0.300	14.596	15.362	0.280	<b>9.545</b>	<b>10.044</b>	<b>0.181</b>	14.047	14.855	0.334
	3	14.089	15.347	0.509	14.758	16.068	0.296	15.211	16.611	0.320	8.187	8.919	0.114	<b>7.243</b>	<b>7.896</b>	<b>0.097</b>
	4	21.320	22.690	0.910	13.912	14.775	0.251	12.680	13.417	0.211	<b>4.292</b>	<b>4.602</b>	<b>0.033</b>	10.617	11.246	0.217
	5	<b>4.000</b>	<b>4.344</b>	<b>0.023</b>	10.585	11.546	0.174	10.289	11.317	0.190	6.307	6.904	0.070	5.432	5.972	0.059
2	1	<b>18.990</b>	<b>20.425</b>	<b>0.593</b>	48.767	51.352	3.011	42.791	45.247	2.179	39.755	43.722	3.463	55.698	60.252	4.874
	2	24.376	26.351	0.794	21.327	23.118	0.503	21.580	23.421	0.546	<b>17.257</b>	<b>18.872</b>	<b>0.436</b>	29.991	32.676	1.211
	3	14.932	16.231	0.323	20.748	22.466	0.485	21.362	23.133	0.521	<b>14.655</b>	<b>15.945</b>	<b>0.283</b>	22.465	24.701	0.868
	4	23.059	24.473	0.749	<b>18.712</b>	<b>19.873</b>	<b>0.394</b>	18.799	20.043	0.414	21.813	22.950	0.538	40.422	42.806	2.994
	5	22.683	24.103	0.766	11.183	12.028	0.208	<b>7.031</b>	<b>7.714</b>	<b>0.126</b>	21.810	23.197	0.571	24.720	26.188	1.220

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Model		CNN			LSTM			GRU			MLP			Attention		
Group	Battery	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
3	1	15.612	16.914	0.532	21.112	22.718	0.539	11.071	11.960	<b>0.158</b>	<b>10.898</b>	<b>11.856</b>	0.188	11.674	12.851	0.328
	2	30.956	33.652	1.983	9.536	10.344	0.147	<b>6.922</b>	<b>7.560</b>	<b>0.072</b>	16.357	17.832	0.330	26.941	29.241	1.030
	3	17.819	18.979	0.449	18.281	19.284	0.403	13.675	14.430	<b>0.223</b>	13.086	14.064	0.229	<b>11.789</b>	<b>12.775</b>	0.254
	4	12.592	13.496	0.268	<b>5.760</b>	<b>6.169</b>	<b>0.048</b>	6.407	6.824	0.057	7.304	7.792	0.092	15.846	17.197	0.620
	5	10.384	11.155	0.183	5.690	6.120	0.053	<b>4.614</b>	<b>5.026</b>	<b>0.035</b>	5.712	6.243	0.056	14.193	15.289	0.315
4	1	19.135	20.922	0.619	13.545	14.906	0.289	<b>11.680</b>	<b>13.047</b>	<b>0.258</b>	45.260	49.442	2.108	19.067	21.028	0.516
	2	6.851	7.373	0.138	7.981	8.564	0.101	8.957	9.558	0.118	<b>4.812</b>	<b>5.224</b>	<b>0.046</b>	7.459	7.963	0.107
	3	27.736	29.551	0.884	6.510	7.015	0.076	7.117	7.686	0.082	<b>4.914</b>	<b>5.336</b>	<b>0.047</b>	5.303	5.707	0.062
	4	51.399	54.698	2.998	6.934	7.484	0.081	6.576	7.086	<b>0.063</b>	<b>6.456</b>	<b>7.042</b>	0.086	10.862	11.710	0.216
	5	8.956	9.683	0.203	7.922	8.653	0.104	7.775	8.534	0.112	12.891	13.977	0.222	<b>6.976</b>	<b>7.571</b>	<b>0.075</b>
5	1	13.919	15.157	0.345	<b>6.464</b>	<b>7.167</b>	0.075	7.948	8.614	0.087	11.595	12.580	0.180	6.956	7.677	<b>0.069</b>
	2	6.310	6.838	0.109	<b>4.167</b>	<b>4.532</b>	<b>0.031</b>	6.513	7.059	0.058	7.349	7.942	0.076	10.803	11.717	0.165
	3	17.880	19.290	0.565	<b>4.423</b>	<b>4.811</b>	<b>0.035</b>	5.641	6.051	0.043	20.321	21.822	0.442	16.540	18.035	0.544
	4	15.825	17.189	0.459	9.162	10.088	0.123	6.130	6.751	0.055	5.131	5.734	<b>0.052</b>	<b>4.876</b>	<b>5.421</b>	0.057
	5	10.134	11.212	0.240	9.833	10.613	<b>0.130</b>	9.802	10.510	0.133	<b>7.617</b>	<b>8.338</b>	0.138	17.525	19.042	0.527
6	1	30.502	32.991	1.430	<b>11.709</b>	<b>12.494</b>	<b>0.188</b>	12.419	13.146	0.215	13.887	14.565	0.393	20.194	21.383	0.856
	2	15.640	16.915	0.494	16.884	18.256	0.345	13.012	14.162	0.224	<b>5.043</b>	<b>5.555</b>	<b>0.048</b>	10.559	11.480	0.204
	3	27.821	30.081	1.395	12.043	13.142	0.244	11.501	12.689	0.237	<b>6.840</b>	<b>7.510</b>	<b>0.101</b>	13.315	14.518	0.353
	4	31.525	33.904	1.455	7.315	7.871	0.085	7.199	7.763	0.081	<b>6.131</b>	<b>6.706</b>	0.093	6.319	6.876	<b>0.075</b>
	5	<b>4.222</b>	<b>4.574</b>	<b>0.028</b>	7.873	8.510	0.097	6.483	7.068	0.068	6.836	7.469	0.078	7.001	7.571	0.111
7	1	24.136	25.967	0.787	15.820	17.018	0.321	14.828	15.999	<b>0.267</b>	20.200	21.781	0.502	<b>14.339</b>	<b>15.640</b>	0.568
	2	30.633	32.651	1.269	18.377	19.660	0.417	<b>16.626</b>	<b>17.802</b>	<b>0.336</b>	28.497	30.280	1.108	27.280	28.881	1.528
	3	12.084	13.058	0.277	<b>6.063</b>	<b>6.618</b>	<b>0.081</b>	6.283	6.943	0.102	16.710	18.123	0.421	13.988	15.191	0.368
	4	27.108	29.337	3.554	8.755	9.532	0.149	<b>6.144</b>	<b>6.823</b>	<b>0.106</b>	40.779	44.313	2.356	19.941	21.584	1.036
	5	30.877	32.957	1.211	10.795	11.593	0.178	<b>9.598</b>	<b>10.424</b>	0.168	9.751	10.500	<b>0.148</b>	19.484	20.842	0.651
8	1	8.755	9.413	0.141	13.939	14.954	0.219	13.007	13.931	0.208	<b>5.628</b>	<b>6.026</b>	<b>0.061</b>	9.070	9.710	0.188
	2	24.004	26.189	0.697	15.526	16.917	0.265	15.106	16.430	0.249	<b>5.194</b>	<b>5.747</b>	<b>0.049</b>	8.702	9.525	0.132
	3	13.993	15.119	0.306	<b>5.432</b>	<b>5.952</b>	<b>0.054</b>	5.884	6.389	0.056	9.697	10.499	0.121	6.504	7.093	0.067
	4	<b>10.897</b>	<b>11.888</b>	<b>0.281</b>	39.529	42.156	1.758	31.777	33.961	1.190	17.170	18.561	0.393	12.889	13.958	0.300
	5	18.006	19.627	0.828	11.971	13.048	0.172	10.194	11.126	0.128	<b>5.867</b>	<b>6.461</b>	<b>0.074</b>	13.179	14.303	0.304
9	1	26.796	29.267	1.109	12.391	13.550	0.179	18.757	20.372	0.388	<b>5.818</b>	<b>6.376</b>	<b>0.054</b>	8.525	9.387	0.152
	2	5.620	6.192	<b>0.062</b>	7.143	7.799	0.088	11.747	12.565	0.171	7.007	7.642	0.082	<b>4.774</b>	<b>5.307</b>	0.065
	3	<b>3.440</b>	<b>3.784</b>	<b>0.024</b>	6.565	7.208	0.066	6.085	6.644	0.058	5.603	6.094	0.049	3.721	4.080	0.027
	4	<b>7.373</b>	<b>7.944</b>	<b>0.128</b>	11.871	12.681	0.205	12.573	13.442	0.204	14.156	15.240	0.265	21.656	22.862	1.150
	5	40.920	44.150	2.874	<b>5.925</b>	<b>6.422</b>	0.059	5.969	6.464	<b>0.051</b>	6.972	7.586	0.074	9.992	10.901	0.228

**Note:** (1). All values are the average value of 3 experiments; (2). For intuitive display, all values have been magnified 1000 times.

Table C.9: The results of Toyota-MIT-Stanford dataset, the input type is handcraft features with z-score normalization. The best result was **bolded**.

Model		CNN			LSTM			GRU			MLP			Attention		
Group	Battery	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
1	1	<b>6.997</b>	<b>7.608</b>	<b>0.067</b>	9.603	10.413	0.109	11.952	13.012	0.223	79.810	88.171	17.250	9.446	10.258	0.127
	2	<b>5.520</b>	<b>6.027</b>	<b>0.052</b>	6.029	6.579	0.060	10.120	11.196	0.253	48.036	52.212	3.513	7.432	8.107	0.113
	3	<b>3.823</b>	<b>4.138</b>	0.024	3.927	4.248	<b>0.023</b>	9.777	10.661	0.188	19.409	21.039	0.731	5.724	6.222	0.064
	4	10.051	10.691	0.136	<b>9.343</b>	<b>9.872</b>	<b>0.115</b>	13.707	14.642	0.300	67.989	72.265	5.611	10.812	11.540	0.196
	5	3.971	4.304	0.042	<b>3.372</b>	<b>3.672</b>	<b>0.025</b>	9.143	9.945	0.230	52.763	56.515	3.917	6.341	6.906	0.094
2	1	<b>9.135</b>	<b>9.686</b>	<b>0.143</b>	21.102	22.369	0.656	16.676	17.717	0.581	228.622	243.692	98.337	17.170	18.160	0.496
	2	<b>6.650</b>	<b>7.167</b>	<b>0.061</b>	7.713	8.287	0.073	11.369	12.312	0.212	58.459	63.140	4.113	8.484	9.136	0.109
	3	6.657	7.205	0.072	<b>6.035</b>	<b>6.613</b>	<b>0.062</b>	9.175	9.931	0.145	87.847	94.274	9.091	6.931	7.559	0.085
	4	6.918	7.346	0.077	<b>6.483</b>	<b>6.889</b>	<b>0.064</b>	9.363	10.015	0.210	36.698	39.134	2.521	6.842	7.319	0.115
	5	4.482	4.851	0.051	<b>3.545</b>	<b>3.843</b>	<b>0.028</b>	9.117	9.874	0.346	25.741	27.660	1.612	4.919	5.304	0.069
3	1	17.764	19.654	<b>0.365</b>	20.786	22.915	0.471	20.797	23.060	0.589	160.102	173.814	30.277	<b>17.478</b>	<b>19.212</b>	0.391
	2	<b>9.084</b>	<b>9.649</b>	<b>0.118</b>	11.842	12.543	0.165	14.632	15.584	0.334	45.296	47.873	3.144	10.253	10.929	0.161
	3	7.025	7.592	0.100	<b>6.336</b>	<b>6.752</b>	<b>0.060</b>	11.593	12.309	0.333	22.319	23.781	0.794	9.332	9.949	0.144
	4	15.538	16.615	0.334	<b>8.928</b>	<b>9.670</b>	<b>0.151</b>	10.988	11.789	0.266	162.738	172.533	39.340	9.756	10.444	0.188
	5	8.382	9.039	0.107	<b>7.836</b>	<b>8.522</b>	<b>0.101</b>	10.570	11.386	0.205	104.233	112.476	11.615	8.619	9.271	0.137
1		<b>9.963</b>	<b>10.644</b>	<b>0.142</b>	11.361	12.114	0.194	13.201	14.236	0.316	159.230	168.927	37.559	10.024	10.767	0.163

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Model		CNN			LSTM			GRU			MLP			Attention		
Group	Battery	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
	2	<b>14.928</b>	<b>16.116</b>	<b>0.266</b>	16.740	18.063	0.329	15.962	17.257	0.309	53.908	58.614	5.148	16.882	18.176	0.351
	3	15.064	16.296	0.260	15.853	17.142	0.299	<b>12.889</b>	<b>13.980</b>	<b>0.209</b>	62.793	67.473	6.064	15.112	16.318	0.279
	4	13.039	13.701	<b>0.216</b>	14.513	15.323	0.310	15.309	16.123	0.351	55.311	58.226	4.426	<b>12.739</b>	<b>13.390</b>	0.220
	5	9.772	10.355	<b>0.135</b>	9.832	10.480	0.214	<b>8.238</b>	<b>8.793</b>	0.141	53.417	56.704	4.836	10.570	11.196	0.160
5	1	<b>8.579</b>	<b>9.317</b>	0.179	12.166	13.108	1.090	9.337	10.212	<b>0.165</b>	74.355	79.785	11.865	10.170	11.035	0.196
	2	<b>9.006</b>	<b>9.777</b>	<b>0.105</b>	15.782	17.086	0.296	16.499	17.915	0.334	68.380	74.111	5.847	13.354	14.449	0.219
	3	<b>9.181</b>	<b>9.738</b>	<b>0.120</b>	14.269	15.174	0.280	15.179	16.135	0.308	64.117	68.183	6.187	13.591	14.412	0.271
	4	<b>9.334</b>	<b>9.848</b>	<b>0.112</b>	14.002	14.970	0.271	14.756	15.647	0.284	40.691	43.367	2.654	12.234	12.909	0.193
	5	7.825	8.425	0.085	<b>6.172</b>	<b>6.709</b>	<b>0.071</b>	7.589	8.279	0.108	61.463	67.177	6.736	7.386	8.009	0.096
6	1	4.554	4.845	<b>0.033</b>	8.607	9.222	0.162	7.922	8.520	0.122	26.689	28.362	0.976	<b>4.412</b>	<b>4.734</b>	0.039
	2	<b>9.032</b>	<b>9.483</b>	<b>0.107</b>	11.243	11.810	0.161	11.817	12.383	0.193	28.529	30.080	1.379	11.588	12.209	0.183
	3	<b>6.797</b>	<b>7.352</b>	<b>0.071</b>	11.611	12.509	0.181	12.945	13.951	0.238	34.940	37.943	2.166	7.470	8.098	0.091
	4	<b>4.603</b>	<b>4.909</b>	<b>0.033</b>	9.134	9.666	0.130	9.122	9.653	0.175	35.816	38.131	2.059	7.391	7.863	0.094
	5	<b>7.016</b>	<b>7.591</b>	<b>0.093</b>	13.676	14.645	1.279	14.029	15.069	1.103	49.550	53.304	3.765	10.506	11.348	0.165
7	1	<b>6.368</b>	<b>7.161</b>	<b>0.072</b>	8.705	9.731	0.106	12.772	14.342	0.312	22.602	25.168	0.937	9.453	10.556	0.162
	2	9.507	10.248	0.201	<b>9.020</b>	<b>9.759</b>	<b>0.132</b>	21.634	23.155	2.005	101.406	109.274	13.083	15.327	16.507	0.748
	3	<b>8.168</b>	<b>8.963</b>	<b>0.107</b>	8.736	9.613	0.128	13.486	14.728	0.379	29.191	31.820	1.497	9.847	10.625	0.155
	4	6.997	7.606	0.068	<b>6.650</b>	<b>7.225</b>	<b>0.057</b>	12.008	13.062	0.288	17.644	19.330	0.491	8.223	9.027	0.107
	5	10.049	11.077	0.164	<b>8.664</b>	<b>9.601</b>	<b>0.127</b>	12.117	13.252	0.253	31.152	34.072	1.681	13.497	14.803	0.279
8	1	<b>4.929</b>	<b>5.259</b>	<b>0.035</b>	9.551	10.218	0.137	9.950	10.613	0.151	30.039	32.033	1.453	8.438	9.024	0.098
	2	<b>5.536</b>	<b>6.040</b>	<b>0.047</b>	10.526	11.452	0.171	10.393	11.273	0.151	42.549	46.585	2.773	8.098	8.811	0.113
	3	<b>4.147</b>	<b>4.486</b>	<b>0.030</b>	4.437	4.804	0.042	5.112	5.539	0.058	38.416	41.614	2.734	5.135	5.574	0.050
	4	<b>12.310</b>	<b>13.117</b>	<b>0.181</b>	12.640	13.514	0.252	13.939	14.910	0.297	53.020	56.213	3.652	14.108	15.060	0.254
	5	<b>5.152</b>	<b>5.613</b>	<b>0.048</b>	9.216	10.023	0.113	8.715	9.517	0.112	25.432	27.731	1.096	7.410	8.122	0.091
9	1	6.568	7.120	0.065	7.656	8.257	0.084	8.838	9.572	0.119	49.576	53.341	3.706	<b>6.406</b>	<b>6.883</b>	<b>0.063</b>
	2	10.030	10.660	<b>0.127</b>	11.401	12.115	0.188	12.989	13.808	0.295	92.717	97.820	13.402	<b>9.931</b>	<b>10.561</b>	0.141
	3	<b>5.545</b>	<b>5.958</b>	<b>0.062</b>	7.018	7.642	0.095	6.928	7.477	0.102	43.144	46.329	3.108	5.871	6.312	0.069
	4	<b>8.569</b>	<b>9.240</b>	<b>0.089</b>	10.205	11.065	0.147	10.962	11.860	0.169	47.301	51.288	3.982	8.866	9.574	0.107
	5	<b>5.048</b>	<b>5.412</b>	<b>0.039</b>	8.128	8.773	0.115	7.806	8.451	0.120	71.828	76.884	8.254	6.552	7.006	0.072

**Note:** (1). All values are the average value of 3 experiments; (2). For intuitive display, all values have been magnified 1000 times.

Table C.10: The results of XJTU battery dataset, the input type is complete charging data with  $[-1, 1]$  normalization. The best result was **bolded**.

Model		CNN			LSTM			GRU			MLP			Attention		
Batch	Battery	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
1	1	<b>5.414</b>	<b>5.860</b>	<b>0.046</b>	18.420	20.416	0.621	19.797	21.860	0.655	5.450	5.875	0.053	6.131	6.665	0.062
	2	11.566	12.676	0.217	21.943	24.557	0.871	23.200	25.998	0.961	<b>9.156</b>	<b>10.252</b>	<b>0.148</b>	14.888	16.387	0.297
	3	9.875	11.232	0.199	19.817	22.516	0.811	23.102	25.717	0.880	<b>9.617</b>	<b>10.839</b>	<b>0.183</b>	11.470	12.856	0.262
	4	<b>3.453</b>	<b>3.754</b>	<b>0.022</b>	20.239	22.786	0.837	22.095	24.770	0.897	4.037	4.428	0.030	8.020	8.824	0.117
	5	11.850	12.570	0.240	20.587	23.246	0.844	21.709	24.475	0.893	<b>4.639</b>	<b>5.064</b>	<b>0.033</b>	6.464	7.106	0.066
	6	4.652	5.103	0.035	19.365	21.790	0.768	20.432	22.986	0.818	<b>4.012</b>	<b>4.337</b>	<b>0.025</b>	5.389	5.891	0.047
	7	31.364	33.610	1.124	21.534	24.119	0.860	24.569	27.330	0.990	<b>9.208</b>	<b>9.855</b>	<b>0.103</b>	14.481	15.521	0.248
	8	20.721	22.566	0.521	18.734	20.908	0.693	20.223	22.515	0.732	13.061	14.318	<b>0.206</b>	<b>11.698</b>	<b>13.022</b>	0.221
2	1	23.739	25.186	1.219	12.584	13.283	0.210	15.099	16.110	0.331	<b>9.887</b>	<b>10.674</b>	<b>0.123</b>	11.461	12.431	0.172
	2	14.758	15.799	0.278	<b>14.073</b>	<b>14.696</b>	<b>0.276</b>	14.126	15.001	0.285	18.112	19.280	0.393	19.098	20.336	0.475
	3	38.136	40.546	2.409	23.506	26.673	1.407	36.949	40.539	2.092	<b>22.097</b>	<b>23.945</b>	<b>1.024</b>	27.722	29.762	1.232
	4	45.596	49.027	3.380	15.362	<b>16.601</b>	<b>0.313</b>	16.809	18.275	0.372	<b>15.326</b>	16.808	0.320	16.463	17.858	0.372
	5	17.163	18.246	0.611	16.416	17.799	0.349	17.017	18.709	0.406	<b>9.273</b>	<b>9.950</b>	<b>0.117</b>	9.354	10.041	0.127
	6	9.472	10.214	0.119	12.572	13.503	0.209	11.777	12.764	0.221	<b>7.883</b>	<b>8.538</b>	<b>0.099</b>	8.008	8.792	0.132
	7	26.607	28.048	1.507	14.194	15.314	0.253	13.896	15.467	0.344	<b>8.543</b>	<b>8.975</b>	<b>0.110</b>	9.410	10.262	0.141
	8	9.581	10.232	0.189	16.819	18.121	0.396	17.406	18.986	0.465	<b>6.865</b>	<b>7.324</b>	<b>0.067</b>	7.385	7.903	0.077
	9	<b>9.341</b>	<b>10.409</b>	<b>0.169</b>	29.900	32.535	1.074	34.364	37.268	1.393	20.273	22.674	0.563	16.333	18.399	0.423
	10	18.511	20.014	0.444	28.329	31.394	1.123	28.218	31.112	1.042	15.062	16.106	0.321	<b>14.852</b>	<b>15.933</b>	<b>0.315</b>
	11	<b>7.584</b>	<b>8.452</b>	<b>0.111</b>	25.055	28.096	1.005	24.838	27.743	0.903	13.226	14.227	0.292	11.199	12.158	0.213
	12	18.931	20.327	0.572	21.828	23.621	0.619	24.714	26.863	0.764	7.770	8.581	0.093	<b>5.647</b>	<b>6.226</b>	<b>0.049</b>
	13	6.789	7.319	0.064	36.320	38.804	1.533	37.711	40.333	1.677	<b>5.864</b>	<b>6.333</b>	<b>0.055</b>	9.766	10.558	0.123
	14	18.344	19.978	0.564	26.785	30.237	1.209	24.886	27.959	0.943	7.660	8.314	<b>0.104</b>	<b>7.568</b>	<b>8.286</b>	0.109
	15	<b>5.634</b>	<b>6.275</b>	<b>0.056</b>	31.710	36.247	1.857	28.713	32.716	1.433	10.804	11.925	0.179	13.064	14.664	0.274
1		<b>10.812</b>	<b>11.870</b>	<b>0.186</b>	30.595	33.923	1.699	30.437	33.555	1.532	13.427	14.801	0.271	15.717	16.998	0.299

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Model		CNN			LSTM			GRU			MLP			Attention		
Batch	Battery	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
	2	7.055	7.782	0.095	30.228	33.280	1.551	33.728	36.645	1.599	7.502	8.308	0.099	<b>5.198</b>	<b>5.612</b>	<b>0.046</b>
	3	8.588	9.373	0.129	22.792	25.083	1.047	36.466	39.098	1.584	<b>7.414</b>	<b>8.197</b>	0.120	7.871	8.608	<b>0.116</b>
	4	10.515	11.529	0.188	30.228	32.753	1.348	29.669	32.215	1.292	<b>6.144</b>	<b>6.679</b>	<b>0.063</b>	6.921	7.527	0.081
	5	8.259	8.799	0.097	29.094	32.354	1.697	28.096	31.046	1.442	<b>7.301</b>	<b>7.747</b>	<b>0.069</b>	7.674	8.127	0.080
	6	5.493	5.884	0.053	24.650	27.495	1.236	24.828	27.411	1.105	<b>4.819</b>	<b>5.201</b>	<b>0.039</b>	6.785	7.326	0.064
	7	<b>6.658</b>	<b>7.163</b>	0.075	23.393	25.748	1.122	21.809	24.028	0.975	7.201	7.724	<b>0.073</b>	9.677	10.442	0.136
	8	5.142	5.392	0.038	22.417	24.601	0.999	19.000	20.971	0.694	<b>4.276</b>	<b>4.598</b>	<b>0.030</b>	4.953	5.298	0.038
4	1	<b>9.502</b>	<b>10.623</b>	<b>0.183</b>	25.751	28.764	1.253	27.725	30.809	1.319	16.313	18.164	0.413	15.827	17.542	0.366
	2	<b>4.585</b>	<b>5.080</b>	<b>0.047</b>	25.099	27.771	1.325	28.343	31.001	1.331	5.752	6.420	0.091	5.793	6.424	0.080
	3	8.479	9.319	0.133	28.711	31.787	1.475	31.023	34.100	1.523	6.703	7.441	0.099	<b>6.500</b>	<b>7.122</b>	<b>0.075</b>
	4	<b>15.392</b>	<b>16.402</b>	<b>0.270</b>	26.196	28.827	1.209	25.392	28.035	1.192	18.481	19.657	0.390	21.093	22.386	0.504
	5	<b>5.478</b>	<b>5.908</b>	<b>0.044</b>	19.661	21.995	0.858	20.585	22.963	0.895	6.823	7.331	0.071	6.925	7.437	0.070
	6	<b>5.586</b>	<b>6.078</b>	<b>0.054</b>	19.284	21.312	0.858	19.950	22.039	0.877	6.374	6.939	0.075	6.054	6.594	0.067
	7	11.718	12.689	0.196	23.699	26.545	1.133	27.949	30.925	1.328	<b>8.263</b>	<b>8.913</b>	<b>0.091</b>	9.306	10.087	0.123
	8	<b>7.209</b>	<b>7.819</b>	<b>0.086</b>	21.800	24.229	1.022	22.261	24.769	1.049	7.970	8.635	0.094	7.642	8.344	0.101
5	1	12.724	13.857	0.622	33.530	37.236	1.722	33.106	36.860	1.729	11.280	12.273	0.227	<b>9.927</b>	<b>10.841</b>	<b>0.214</b>
	2	20.708	22.211	0.690	31.607	34.936	1.639	31.895	35.152	1.590	<b>12.647</b>	<b>13.819</b>	<b>0.234</b>	13.922	15.181	0.291
	3	18.757	20.570	0.696	36.752	41.196	2.179	35.964	40.465	2.170	<b>12.297</b>	<b>13.747</b>	<b>0.260</b>	15.260	16.941	0.364
	4	15.192	16.370	0.323	37.820	42.218	2.337	38.750	43.239	2.451	11.163	12.121	0.244	<b>9.540</b>	<b>10.491</b>	<b>0.188</b>
	5	<b>10.634</b>	<b>11.733</b>	<b>0.168</b>	37.516	42.448	2.398	38.139	43.152	2.474	16.200	17.955	0.394	12.654	14.059	0.263
	6	14.153	15.339	0.402	35.695	39.873	2.062	36.652	40.838	2.109	10.066	11.031	0.215	<b>9.156</b>	<b>10.100</b>	<b>0.183</b>
	7	<b>13.930</b>	<b>14.998</b>	<b>0.243</b>	34.344	38.056	1.855	34.260	38.021	1.886	14.604	15.843	0.312	17.521	18.935	0.472
	8	13.325	14.760	0.306	40.847	46.420	2.869	40.149	45.821	2.911	<b>10.649</b>	<b>11.838</b>	<b>0.284</b>	13.951	15.375	0.332
6	1	<b>12.049</b>	<b>12.957</b>	<b>0.220</b>	34.736	38.043	1.963	34.508	37.826	1.964	15.817	17.612	0.614	13.545	15.151	0.485
	2	13.816	15.020	0.355	25.100	27.533	1.211	24.429	26.867	1.197	14.465	15.729	0.399	<b>12.409</b>	<b>13.559</b>	<b>0.324</b>
	3	14.991	16.453	<b>0.358</b>	24.515	27.388	1.511	24.265	27.158	1.534	<b>13.047</b>	<b>14.427</b>	0.381	14.466	16.002	0.444
	4	<b>8.677</b>	<b>9.607</b>	<b>0.177</b>	28.345	31.474	1.637	28.695	31.810	1.634	13.511	15.087	0.475	12.920	14.385	0.413
	5	48.040	52.802	2.969	29.772	33.012	1.358	<b>29.166</b>	<b>32.343</b>	<b>1.305</b>	69.040	75.452	5.143	62.452	68.207	4.298
	6	<b>34.226</b>	<b>36.042</b>	<b>1.376</b>	37.803	40.831	2.053	37.016	40.060	2.023	38.733	40.564	1.719	39.073	41.008	1.782
	7	<b>10.350</b>	<b>11.191</b>	<b>0.168</b>	23.262	25.644	1.188	22.608	24.994	1.187	11.121	12.058	0.263	11.416	12.428	0.291
	8	<b>8.212</b>	<b>8.925</b>	<b>0.158</b>	23.989	26.316	1.173	23.937	26.265	1.181	10.824	11.721	0.260	9.022	9.839	0.201

**Note:** (1). All values are the average value of 3 experiments; (2). For intuitive display, all values have been magnified 1000 times.

Table C.11: The results of XJTU battery dataset, the input type is partial charging data with  $[-1, 1]$  normalization. The best result was **bolded**.

Model		CNN			LSTM			GRU			MLP			Attention		
Batch	Battery	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
1	1	5.566	6.089	0.053	4.526	5.003	0.044	<b>3.810</b>	<b>4.159</b>	<b>0.029</b>	6.148	6.686	0.053	4.988	5.449	0.041
	2	6.534	7.068	<b>0.057</b>	<b>5.858</b>	6.604	0.075	6.407	7.098	0.066	5.868	<b>6.537</b>	0.063	7.958	8.703	0.096
	3	6.086	6.761	0.058	9.045	10.100	0.120	9.538	10.562	0.116	<b>5.890</b>	<b>6.509</b>	<b>0.050</b>	7.071	7.671	0.069
	4	5.212	5.793	0.050	6.593	7.289	0.069	7.584	8.288	0.076	<b>4.521</b>	<b>4.872</b>	<b>0.038</b>	7.708	8.225	0.089
	5	<b>4.218</b>	<b>4.607</b>	0.033	6.282	6.876	0.052	5.016	5.450	<b>0.032</b>	5.004	5.266	0.034	8.451	9.177	0.107
	6	<b>3.385</b>	<b>3.666</b>	<b>0.019</b>	7.999	8.517	0.073	7.744	8.228	0.068	5.813	6.251	0.042	5.500	5.991	0.064
	7	<b>10.507</b>	<b>11.459</b>	0.183	13.130	14.028	0.180	15.721	16.682	0.263	11.406	12.204	<b>0.140</b>	13.375	14.365	0.207
	8	8.375	9.132	0.106	<b>6.405</b>	<b>6.939</b>	<b>0.053</b>	6.856	7.430	0.057	6.613	7.354	0.073	7.373	8.007	0.084
2	1	7.299	7.881	0.098	7.444	7.871	0.068	7.403	7.811	0.067	<b>4.112</b>	<b>4.437</b>	<b>0.030</b>	5.363	5.838	0.042
	2	<b>9.758</b>	<b>10.229</b>	<b>0.118</b>	26.649	28.136	0.750	27.115	28.700	0.779	13.639	14.367	0.207	17.619	18.469	0.379
	3	13.878	14.687	0.321	<b>10.699</b>	<b>11.590</b>	0.148	10.858	11.650	<b>0.142</b>	11.190	11.891	0.189	12.466	13.479	0.243
	4	15.262	16.439	0.452	3.629	3.950	0.021	<b>2.827</b>	<b>3.086</b>	<b>0.015</b>	5.094	5.494	0.044	13.034	14.114	0.222
	5	5.853	6.403	0.081	5.865	6.610	0.076	4.332	4.901	0.051	<b>4.057</b>	<b>4.387</b>	<b>0.033</b>	6.163	7.006	0.132
	6	<b>8.833</b>	<b>9.446</b>	0.119	15.582	16.759	0.293	15.475	16.701	0.298	8.915	9.647	<b>0.099</b>	10.779	11.626	0.170
	7	14.223	15.218	0.231	6.228	6.819	0.061	<b>5.071</b>	<b>5.519</b>	<b>0.038</b>	5.768	6.243	0.047	21.166	23.451	0.746
	8	5.751	6.089	0.049	<b>4.566</b>	<b>4.817</b>	<b>0.036</b>	5.233	5.567	0.042	5.501	5.805	0.046	6.194	6.645	0.082
	9	9.838	10.647	0.190	9.033	10.092	0.122	7.722	8.494	0.088	<b>4.417</b>	<b>4.780</b>	<b>0.032</b>	8.241	9.198	0.110
	10	6.144	6.631	0.052	<b>4.603</b>	<b>5.176</b>	0.060	6.310	6.953	0.082	4.934	5.460	<b>0.044</b>	10.273	11.231	0.172
	11	8.644	9.316	0.121	16.968	18.749	0.350	17.811	19.498	0.366	<b>3.575</b>	<b>3.899</b>	<b>0.029</b>	6.029	6.655	0.062
	12	<b>5.983</b>	<b>6.557</b>	<b>0.046</b>	14.454	15.906	0.257	15.124	16.514	0.270	6.827	7.464	0.073	13.799	15.156	0.222
	13	8.398	9.056	0.112	7.704	8.607	0.114	8.523	9.374	0.113	<b>5.103</b>	<b>5.601</b>	<b>0.050</b>	12.237	13.458	0.208
	14	18.477	20.027	0.555	9.783	10.889	0.147	9.554	10.490	0.138	<b>5.845</b>	<b>6.421</b>	<b>0.057</b>	9.721	10.690	0.128
	15	23.146	25.223	1.214	17.462	19.408	0.354	17.364	19.139	0.342	<b>3.818</b>	<b>4.230</b>	<b>0.033</b>	8.773	10.069	0.159

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Model		CNN			LSTM			GRU			MLP			Attention		
Batch	Battery	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
3	1	<b>5.986</b>	<b>6.514</b>	<b>0.060</b>	8.357	9.123	0.107	7.622	8.284	0.088	6.229	6.712	0.061	7.104	7.687	0.079
	2	6.804	7.183	0.071	6.531	7.008	0.061	6.390	6.824	0.056	<b>4.691</b>	<b>5.018</b>	<b>0.035</b>	6.433	6.849	0.064
	3	8.377	8.841	0.121	<b>5.084</b>	<b>5.460</b>	<b>0.039</b>	5.133	5.482	0.039	7.690	8.214	0.098	14.847	15.847	0.366
	4	6.507	6.868	0.065	8.505	8.855	0.102	8.636	9.015	0.101	<b>5.701</b>	<b>6.031</b>	<b>0.051</b>	8.632	9.215	0.119
	5	8.845	9.175	0.123	6.670	7.146	0.063	6.549	6.968	0.059	<b>5.954</b>	<b>6.315</b>	<b>0.052</b>	6.561	7.073	0.071
	6	5.721	6.136	0.058	5.627	6.025	0.054	5.778	6.150	0.055	<b>5.193</b>	<b>5.571</b>	<b>0.048</b>	8.578	9.068	0.109
	7	5.151	5.563	0.044	5.075	5.354	0.044	5.100	5.361	0.044	<b>4.850</b>	<b>5.126</b>	<b>0.043</b>	6.481	6.828	0.070
	8	4.677	4.905	0.037	4.896	5.155	0.037	5.115	5.377	0.039	<b>4.188</b>	<b>4.452</b>	<b>0.033</b>	11.002	11.531	0.210
4	1	<b>6.402</b>	<b>6.971</b>	<b>0.076</b>	10.635	11.823	0.215	10.202	11.219	0.178	8.088	8.878	0.113	10.578	11.526	0.193
	2	<b>5.312</b>	<b>5.777</b>	<b>0.055</b>	11.235	12.180	0.191	10.918	11.777	0.171	6.771	7.373	0.086	10.071	10.798	0.167
	3	10.294	11.398	0.197	11.048	12.165	0.217	10.526	11.552	0.190	<b>8.445</b>	<b>9.227</b>	<b>0.133</b>	11.750	12.825	0.218
	4	10.976	11.742	0.237	12.661	13.601	0.230	12.657	13.595	0.224	10.529	11.311	0.148	<b>9.020</b>	<b>9.677</b>	<b>0.121</b>
	5	6.942	7.600	0.076	9.296	10.143	0.146	9.847	10.691	0.144	<b>6.897</b>	<b>7.496</b>	<b>0.071</b>	9.631	10.457	0.175
	6	<b>6.931</b>	<b>7.545</b>	<b>0.080</b>	11.216	12.108	0.177	11.856	12.782	0.190	9.040	9.770	0.119	7.989	8.596	0.109
	7	8.002	8.617	<b>0.095</b>	9.397	10.234	0.162	10.064	10.939	0.183	7.765	8.347	0.103	<b>7.175</b>	<b>7.767</b>	0.099
	8	8.988	9.910	0.157	11.661	12.647	0.193	12.029	13.037	0.196	<b>7.247</b>	<b>7.861</b>	<b>0.087</b>	11.482	12.353	0.179
5	1	<b>12.001</b>	<b>12.941</b>	<b>0.241</b>	32.790	36.544	1.724	32.610	36.303	1.676	17.657	19.283	0.540	12.873	13.957	0.273
	2	17.507	18.943	0.596	31.483	34.886	1.699	32.108	35.412	1.653	18.066	19.773	0.429	<b>16.056</b>	<b>17.529</b>	<b>0.346</b>
	3	16.666	18.167	0.418	37.242	41.705	2.202	36.448	40.935	2.191	<b>13.905</b>	<b>15.436</b>	0.342	13.973	15.606	<b>0.334</b>
	4	24.803	26.482	0.889	37.198	41.610	2.319	39.678	44.033	2.395	20.135	21.761	0.632	<b>14.550</b>	<b>15.706</b>	<b>0.336</b>
	5	16.839	18.684	<b>0.469</b>	37.628	42.513	2.377	36.163	40.991	2.323	18.484	20.786	0.590	<b>16.346</b>	<b>18.471</b>	0.486
	6	22.657	24.445	0.814	35.489	39.699	2.051	36.757	40.936	2.070	15.723	17.235	0.469	<b>11.132</b>	<b>12.105</b>	<b>0.202</b>
	7	<b>9.109</b>	<b>9.832</b>	<b>0.144</b>	34.253	37.957	1.845	34.851	38.560	1.843	16.688	18.099	0.505	15.297	16.529	0.359
	8	13.765	15.135	0.323	40.086	45.739	2.885	40.701	46.374	2.914	14.554	16.196	0.468	<b>12.600</b>	<b>13.900</b>	<b>0.265</b>
6	1	<b>24.833</b>	<b>26.588</b>	<b>0.864</b>	36.890	40.351	2.281	36.178	39.696	2.279	32.060	34.530	1.392	30.347	32.433	1.245
	2	<b>17.453</b>	<b>18.806</b>	<b>0.601</b>	32.896	35.557	1.719	34.560	37.216	1.791	25.657	27.473	1.040	20.156	21.684	0.700
	3	<b>11.304</b>	<b>12.542</b>	<b>0.307</b>	31.077	34.113	1.820	29.935	33.016	1.792	20.733	22.976	0.951	16.423	18.226	0.644
	4	<b>11.931</b>	<b>13.121</b>	<b>0.284</b>	32.394	35.735	1.982	31.601	34.981	1.968	23.183	25.544	1.014	16.554	18.209	0.541
	5	<b>24.274</b>	<b>27.104</b>	<b>1.005</b>	35.277	39.470	1.977	35.704	40.086	2.079	28.846	32.316	1.394	26.318	29.454	1.198
	6	21.558	22.779	<b>0.628</b>	41.177	44.392	2.498	40.995	44.274	2.487	26.188	28.402	1.156	<b>20.392</b>	<b>21.995</b>	0.726
	7	<b>10.851</b>	<b>11.989</b>	<b>0.324</b>	27.710	30.328	1.430	26.878	29.480	1.391	17.536	19.341	0.701	14.399	15.812	0.466
	8	<b>12.852</b>	<b>14.034</b>	<b>0.335</b>	27.604	30.150	1.411	28.513	30.995	1.414	22.447	24.211	0.787	19.549	21.038	0.550

**Note:** (1). All values are the average value of 3 experiments; (2). For intuitive display, all values have been magnified 1000 times.

Table C.12: The results of XJTU battery dataset, the input type is handcraft features with  $[-1, 1]$  normalization. The best result was **bolded**.

Model		CNN			LSTM			GRU			MLP			Attention		
Batch	Battery	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
1	1	<b>5.162</b>	<b>5.703</b>	0.057	5.901	6.485	<b>0.054</b>	5.716	6.354	0.055	5.818	6.480	0.058	9.193	10.145	0.133
	2	5.383	5.964	0.047	4.960	5.559	0.045	3.612	4.034	0.024	<b>3.405</b>	<b>3.811</b>	<b>0.021</b>	5.959	6.587	0.070
	3	5.594	6.245	0.068	4.971	5.556	0.060	3.988	4.469	0.044	<b>2.940</b>	<b>3.297</b>	<b>0.039</b>	8.229	8.974	0.133
	4	5.568	5.942	0.025	4.079	4.461	0.024	<b>3.103</b>	<b>3.318</b>	<b>0.013</b>	3.947	4.150	0.022	5.904	6.443	0.058
	5	5.468	5.919	0.046	3.637	4.046	0.024	2.507	2.753	0.010	<b>2.126</b>	<b>2.307</b>	<b>0.007</b>	6.384	7.058	0.072
	6	6.015	6.506	0.051	3.172	3.477	0.018	<b>2.666</b>	<b>2.888</b>	<b>0.011</b>	4.695	4.968	0.028	4.922	5.291	0.036
	7	<b>6.000</b>	<b>6.357</b>	<b>0.050</b>	6.703	7.198	0.062	6.397	6.822	0.053	7.761	8.288	0.072	6.288	6.913	0.068
	8	9.335	9.854	0.139	3.221	3.530	0.022	<b>2.910</b>	<b>3.149</b>	<b>0.016</b>	3.341	3.592	0.022	5.966	6.494	0.056
2	1	<b>2.686</b>	<b>3.002</b>	0.020	4.903	5.262	0.035	3.063	3.282	<b>0.017</b>	3.148	3.373	0.020	5.983	6.483	0.059
	2	17.913	18.738	0.514	<b>12.825</b>	<b>13.475</b>	0.212	12.880	13.549	<b>0.191</b>	13.775	14.503	0.207	12.929	13.905	0.270
	3	23.021	24.294	0.864	19.301	20.348	0.454	18.954	19.978	0.445	20.828	21.960	0.544	<b>15.894</b>	<b>16.891</b>	<b>0.338</b>
	4	6.893	7.394	0.082	6.360	6.861	0.064	5.259	5.678	0.046	<b>3.802</b>	<b>4.113</b>	<b>0.028</b>	11.143	12.175	0.214
	5	22.241	23.427	0.929	5.248	5.523	0.040	<b>3.610</b>	<b>3.819</b>	<b>0.024</b>	3.714	3.948	0.026	7.282	7.946	0.093
	6	8.498	9.161	0.138	6.556	7.063	0.065	4.204	4.525	0.030	<b>3.585</b>	<b>3.833</b>	<b>0.025</b>	6.323	6.773	0.069
	7	6.985	7.556	0.077	6.099	6.411	0.051	<b>5.122</b>	<b>5.496</b>	<b>0.038</b>	5.548	5.992	0.049	7.187	7.926	0.103
	8	17.726	18.712	0.508	10.147	10.809	0.135	10.025	10.735	0.123	9.340	10.033	0.108	<b>6.125</b>	<b>6.603</b>	<b>0.060</b>
	9	11.339	12.240	0.186	<b>8.385</b>	<b>9.241</b>	<b>0.089</b>	10.734	11.627	0.130	12.087	12.961	0.177	13.890	15.059	0.226
	10	6.001	6.602	0.066	7.007	7.969	0.106	<b>4.628</b>	<b>5.235</b>	<b>0.051</b>	6.342	6.917	0.058	8.487	9.520	0.127
	11	6.083	6.630	0.069	10.851	11.906	0.135	8.169	8.925	0.082	<b>3.796</b>	<b>4.152</b>	<b>0.028</b>	12.401	13.609	0.174
	12	4.960	5.369	<b>0.033</b>	7.390	8.053	0.070	6.494	7.013	0.059	<b>4.640</b>	<b>5.018</b>	0.034	9.944	10.701	0.124
	13	14.022	15.093	0.375	4.148	4.609	0.036	<b>3.300</b>	<b>3.647</b>	<b>0.028</b>	3.651	4.025	0.029	7.806	8.631	0.112
	14	10.306	11.180	0.203	12.425	13.672	0.171	9.836	10.801	0.109	<b>5.823</b>	<b>6.345</b>	<b>0.051</b>	11.011	12.098	0.138

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Model		CNN			LSTM			GRU			MLP			Attention		
Batch	Battery	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
	15	13.320	15.005	0.342	18.403	20.382	0.367	15.956	17.553	0.268	<b>12.990</b>	<b>14.212</b>	<b>0.183</b>	20.712	22.890	0.462
3	1	4.407	4.730	0.035	4.897	5.368	0.042	3.460	3.746	0.021	<b>2.965</b>	<b>3.191</b>	<b>0.016</b>	4.966	5.391	0.045
	2	3.760	4.112	0.024	4.321	4.736	0.034	2.933	3.224	0.018	<b>2.925</b>	<b>3.203</b>	<b>0.015</b>	4.967	5.478	0.048
	3	<b>3.279</b>	<b>3.495</b>	<b>0.017</b>	5.507	5.828	0.040	5.434	5.784	0.037	4.315	4.646	0.027	9.348	9.951	0.112
	4	10.425	10.827	0.146	9.088	9.484	0.105	7.508	7.787	0.073	7.292	7.548	0.069	<b>6.132</b>	<b>6.551</b>	<b>0.061</b>
	5	<b>3.191</b>	<b>3.414</b>	<b>0.016</b>	4.623	5.016	0.034	3.872	4.155	0.022	3.994	4.263	0.023	4.456	4.768	0.033
	6	4.350	4.652	0.025	3.317	3.537	0.018	<b>2.862</b>	<b>3.015</b>	<b>0.012</b>	3.644	3.833	0.018	5.654	5.965	0.046
	7	3.934	4.212	0.028	3.544	3.812	0.027	<b>3.001</b>	<b>3.229</b>	0.018	3.043	3.256	<b>0.016</b>	6.276	6.713	0.078
	8	4.920	5.206	0.047	2.511	2.663	<b>0.010</b>	<b>2.436</b>	<b>2.614</b>	0.010	2.469	2.655	0.011	5.512	5.837	0.044
4	1	7.206	7.792	0.062	<b>4.502</b>	<b>5.005</b>	0.043	4.672	5.108	<b>0.036</b>	5.236	5.653	0.041	7.105	7.687	0.080
	2	<b>4.213</b>	<b>4.648</b>	0.047	8.359	8.996	0.092	7.164	7.690	0.066	4.461	4.812	<b>0.033</b>	5.508	5.991	0.060
	3	<b>3.810</b>	<b>4.086</b>	<b>0.023</b>	7.180	7.745	0.072	6.027	6.440	0.051	5.510	5.835	0.044	5.559	5.962	0.049
	4	6.025	6.396	0.043	5.912	6.359	0.051	4.874	5.231	0.036	<b>4.519</b>	<b>4.816</b>	<b>0.031</b>	5.458	5.951	0.055
	5	<b>3.793</b>	<b>4.090</b>	<b>0.021</b>	5.213	5.622	0.044	5.132	5.532	0.040	4.486	4.854	0.031	6.974	7.550	0.074
	6	4.876	5.262	<b>0.034</b>	4.424	4.800	0.037	<b>4.202</b>	<b>4.579</b>	0.035	4.484	4.896	0.038	4.578	4.930	0.039
	7	8.820	9.506	0.098	7.413	8.035	0.074	7.407	7.982	0.070	<b>7.143</b>	<b>7.669</b>	<b>0.064</b>	8.962	9.499	0.111
	8	4.060	4.463	0.030	4.627	5.084	0.043	<b>3.715</b>	4.088	0.027	3.721	<b>4.056</b>	<b>0.025</b>	5.973	6.460	0.056
5	1	16.638	18.192	0.482	<b>9.297</b>	<b>10.185</b>	0.148	10.530	11.559	0.162	23.123	25.187	1.474	9.343	10.221	<b>0.144</b>
	2	11.560	12.360	0.184	8.563	9.227	0.125	<b>6.891</b>	<b>7.411</b>	<b>0.089</b>	22.565	24.471	0.610	7.829	8.458	0.121
	3	11.237	12.483	0.202	10.431	11.744	0.208	<b>8.776</b>	<b>9.868</b>	<b>0.151</b>	11.442	12.510	0.199	9.535	10.605	0.160
	4	8.970	9.704	0.141	6.626	7.290	0.114	<b>6.440</b>	<b>7.085</b>	<b>0.106</b>	16.997	18.785	0.408	9.267	10.136	0.171
	5	13.762	15.480	0.309	<b>11.979</b>	13.386	0.238	12.868	14.241	0.237	12.019	<b>12.926</b>	<b>0.209</b>	14.367	15.746	0.283
	6	8.009	8.717	0.109	6.493	7.188	0.095	<b>5.963</b>	<b>6.586</b>	<b>0.079</b>	8.245	9.009	0.115	8.795	9.718	0.161
	7	<b>7.490</b>	<b>8.232</b>	<b>0.130</b>	10.722	11.599	0.157	11.914	12.884	0.177	17.775	19.149	0.435	10.250	11.194	0.153
	8	14.758	15.973	0.342	13.020	14.685	0.292	11.894	13.420	0.229	<b>10.148</b>	<b>11.095</b>	<b>0.155</b>	12.413	13.875	0.245
6	1	<b>5.441</b>	<b>5.905</b>	<b>0.062</b>	13.106	14.311	0.281	11.452	12.516	0.226	10.761	11.766	0.206	8.263	9.091	0.149
	2	<b>8.820</b>	<b>9.496</b>	<b>0.130</b>	10.065	10.862	0.185	10.750	11.537	0.190	11.018	11.800	0.193	11.648	12.474	0.211
	3	<b>8.417</b>	<b>9.058</b>	<b>0.101</b>	9.571	10.478	0.184	8.943	9.764	0.157	8.647	9.436	0.145	8.974	9.702	0.129
	4	<b>11.940</b>	<b>12.787</b>	<b>0.178</b>	12.826	14.018	0.275	12.806	13.893	0.245	13.396	14.477	0.252	13.707	14.682	0.240
	5	21.862	23.974	0.566	17.011	18.599	0.380	<b>15.664</b>	<b>17.088</b>	<b>0.329</b>	16.253	17.726	0.353	21.889	23.853	0.592
	6	12.039	12.693	<b>0.204</b>	13.015	14.166	0.313	11.155	12.214	0.272	10.967	11.986	0.263	<b>10.773</b>	<b>11.742</b>	0.249
	7	<b>5.754</b>	<b>6.214</b>	<b>0.061</b>	9.466	10.334	0.170	8.540	9.299	0.140	8.527	9.247	0.137	8.290	8.996	0.135
	8	<b>6.113</b>	<b>6.602</b>	<b>0.067</b>	10.877	11.754	0.197	10.773	11.621	0.183	10.330	11.131	0.166	7.675	8.313	0.111

**Note:** (1). All values are the average value of 3 experiments; (2). For intuitive display, all values have been magnified 1000 times.

Table C.13: The results of XJTU battery dataset, the input type is complete charging data with  $[0, 1]$  normalization. The best result was **bolded**.

Model		CNN			LSTM			GRU			MLP			Attention		
Batch	Battery	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
1	1	6.227	6.579	0.062	21.566	23.756	0.757	22.630	24.901	0.818	5.670	6.124	<b>0.054</b>	<b>5.614</b>	<b>6.104</b>	0.054
	2	9.377	10.477	0.156	26.412	29.321	1.085	28.160	31.120	1.157	<b>7.853</b>	8.802	0.125	7.895	<b>8.747</b>	<b>0.102</b>
	3	<b>12.259</b>	<b>13.816</b>	<b>0.250</b>	21.176	24.094	0.932	21.937	24.884	0.948	14.047	15.862	0.354	14.504	15.892	0.332
	4	7.061	7.533	0.089	22.090	24.804	0.938	24.354	27.242	1.058	<b>5.362</b>	<b>5.896</b>	<b>0.047</b>	6.837	7.551	0.078
	5	<b>5.014</b>	<b>5.559</b>	<b>0.043</b>	22.131	25.068	0.982	23.102	26.113	1.038	6.824	7.485	0.065	7.191	7.916	0.084
	6	5.472	5.924	0.045	20.869	23.596	0.919	22.511	25.371	1.009	<b>4.817</b>	<b>5.241</b>	<b>0.035</b>	5.041	5.603	0.051
	7	20.246	22.082	0.511	24.740	27.634	1.055	25.794	28.787	1.127	<b>7.377</b>	<b>8.024</b>	<b>0.073</b>	13.052	13.952	0.223
	8	17.795	19.535	0.430	20.725	23.120	0.802	22.415	24.991	0.898	13.119	14.277	0.212	<b>10.095</b>	<b>10.990</b>	<b>0.138</b>
2	1	<b>4.692</b>	<b>5.206</b>	<b>0.048</b>	18.314	19.945	0.466	16.909	18.360	0.390	13.761	14.951	0.281	10.892	11.919	0.164
	2	43.982	46.475	3.211	18.601	19.912	0.514	<b>16.805</b>	<b>17.906</b>	0.418	18.190	19.291	<b>0.410</b>	20.154	21.272	0.464
	3	24.247	26.278	1.005	22.379	25.034	0.972	21.274	24.023	1.050	<b>16.871</b>	<b>18.141</b>	<b>0.566</b>	20.076	21.554	0.693
	4	<b>14.478</b>	<b>15.859</b>	<b>0.261</b>	21.063	23.338	0.635	20.507	22.723	0.596	17.373	19.087	0.420	15.895	17.570	0.357
	5	41.026	43.848	2.603	19.493	21.387	0.524	18.973	20.915	0.521	<b>9.154</b>	<b>9.784</b>	<b>0.119</b>	10.217	11.120	0.145
	6	8.647	9.289	0.101	14.730	16.097	0.389	13.533	14.757	0.322	8.999	9.713	0.116	<b>6.800</b>	<b>7.293</b>	<b>0.076</b>
	7	<b>6.004</b>	<b>6.538</b>	<b>0.070</b>	20.295	22.431	0.628	18.109	20.149	0.542	8.941	9.442	0.111	7.169	7.702	0.097
	8	<b>6.605</b>	<b>7.007</b>	<b>0.061</b>	19.066	20.762	0.525	19.209	20.991	0.566	8.847	9.347	0.105	8.760	9.165	0.118
	9	13.068	14.653	<b>0.286</b>	35.128	38.305	1.505	35.638	38.737	1.514	22.162	24.878	0.714	<b>12.721</b>	<b>14.481</b>	0.317
	10	29.916	32.283	1.944	34.543	37.868	1.499	33.605	36.833	1.412	19.580	20.832	0.549	<b>18.764</b>	<b>20.221</b>	<b>0.479</b>
	11	<b>9.550</b>	<b>10.431</b>	<b>0.127</b>	30.564	33.827	1.245	28.766	31.899	1.111	15.223	16.321	0.372	13.486	14.492	0.315
	12	18.039	19.870	0.679	29.027	31.403	1.068	29.992	32.508	1.120	<b>7.790</b>	<b>8.649</b>	<b>0.091</b>	8.479	9.459	0.124
	13	<b>5.759</b>	<b>6.271</b>	<b>0.054</b>	39.056	41.934	1.824	40.490	43.407	1.941	6.616	7.156	0.078	9.677	10.492	0.136

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Model		CNN			LSTM			GRU			MLP			Attention		
Batch	Battery	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
	14	20.179	21.829	0.628	29.679	33.150	1.274	28.364	31.717	1.168	<b>11.093</b>	<b>12.075</b>	<b>0.193</b>	12.202	13.493	0.232
	15	<b>5.538</b>	<b>6.216</b>	<b>0.069</b>	32.615	36.678	1.557	30.616	34.684	1.505	14.093	15.610	0.278	14.305	15.978	0.309
3	1	<b>12.755</b>	<b>13.900</b>	<b>0.244</b>	32.147	35.668	1.824	32.699	36.256	1.871	13.142	14.662	0.308	13.378	14.795	0.275
	2	<b>5.312</b>	<b>5.876</b>	<b>0.052</b>	30.109	33.259	1.589	33.662	37.206	1.907	6.698	7.469	0.090	7.943	8.881	0.146
	3	11.084	12.038	0.207	23.291	25.630	1.031	22.519	24.742	0.965	8.683	9.489	0.142	<b>5.714</b>	<b>6.206</b>	<b>0.059</b>
	4	15.993	17.358	0.453	32.166	35.263	1.674	33.011	36.045	1.677	<b>7.605</b>	<b>8.364</b>	<b>0.105</b>	8.517	9.398	0.150
	5	14.996	15.736	0.324	27.359	30.033	1.361	31.330	34.731	1.833	<b>7.870</b>	<b>8.442</b>	<b>0.085</b>	8.234	8.789	0.088
	6	<b>3.891</b>	<b>4.182</b>	<b>0.026</b>	26.406	29.292	1.317	26.959	30.092	1.432	5.446	5.913	0.050	5.879	6.386	0.056
	7	<b>6.006</b>	<b>6.556</b>	<b>0.067</b>	22.374	24.721	1.072	24.529	27.203	1.273	7.101	7.676	0.077	9.847	10.563	0.143
	8	8.252	8.738	0.119	22.859	25.134	1.015	23.516	25.853	1.057	5.026	5.403	0.040	<b>4.087</b>	<b>4.384</b>	<b>0.027</b>
4	1	<b>9.281</b>	<b>10.284</b>	<b>0.147</b>	27.086	30.278	1.371	27.771	30.926	1.357	18.683	20.770	0.519	18.513	20.530	0.487
	2	<b>4.869</b>	<b>5.352</b>	<b>0.046</b>	27.037	29.784	1.335	27.047	29.784	1.341	7.831	8.750	0.161	6.531	7.365	0.137
	3	8.875	9.836	0.154	30.522	33.763	1.581	29.758	33.002	1.567	<b>8.220</b>	<b>9.091</b>	<b>0.142</b>	8.631	9.523	0.145
	4	<b>10.321</b>	<b>11.083</b>	<b>0.156</b>	27.972	30.742	1.318	27.276	30.064	1.324	20.966	22.311	0.513	20.222	21.439	0.463
	5	<b>5.607</b>	<b>6.028</b>	<b>0.046</b>	22.060	24.627	1.008	22.217	24.773	1.020	6.400	6.930	0.069	7.587	8.189	0.083
	6	6.011	6.478	<b>0.054</b>	20.399	22.562	0.925	20.980	23.188	0.964	6.512	7.076	0.079	<b>5.902</b>	<b>6.432</b>	0.064
	7	10.759	11.669	0.182	22.135	24.830	1.059	22.619	25.269	1.047	<b>4.789</b>	<b>5.169</b>	<b>0.036</b>	5.172	5.599	0.042
	8	<b>4.755</b>	<b>5.130</b>	<b>0.038</b>	23.757	26.412	1.135	23.529	26.210	1.150	7.590	8.241	0.090	8.108	8.826	0.105
5	1	26.046	27.896	1.170	33.166	36.929	1.728	33.120	36.920	1.743	<b>10.799</b>	<b>11.661</b>	<b>0.241</b>	13.179	14.216	0.314
	2	<b>14.720</b>	<b>15.804</b>	<b>0.355</b>	32.301	35.683	1.712	32.491	35.884	1.722	19.921	21.778	0.510	21.301	23.330	0.578
	3	<b>13.657</b>	<b>14.878</b>	<b>0.267</b>	36.319	40.798	2.209	36.764	41.235	2.221	15.804	17.883	0.483	19.420	22.052	0.702
	4	14.914	16.045	0.409	38.401	42.796	2.344	37.720	42.134	2.318	<b>11.029</b>	<b>12.049</b>	<b>0.277</b>	11.736	12.776	0.279
	5	23.009	24.761	0.783	37.329	42.150	2.356	36.831	41.676	2.352	<b>10.978</b>	<b>12.187</b>	<b>0.246</b>	13.402	15.062	0.341
	6	15.760	16.977	0.369	36.098	40.320	2.067	35.538	39.756	2.048	<b>11.294</b>	<b>12.383</b>	<b>0.290</b>	16.200	17.482	0.435
	7	<b>9.157</b>	<b>9.901</b>	<b>0.180</b>	33.881	37.640	1.843	34.890	38.601	1.861	19.305	20.857	0.481	20.271	21.834	0.534
	8	<b>11.756</b>	<b>12.842</b>	<b>0.198</b>	40.129	45.786	2.878	41.092	46.665	2.876	18.763	20.516	0.520	21.676	23.665	0.712
6	1	<b>10.131</b>	<b>10.920</b>	<b>0.164</b>	34.209	37.520	1.947	34.260	37.584	1.954	15.734	17.604	0.662	14.332	16.027	0.543
	2	12.494	13.526	<b>0.301</b>	26.029	28.439	1.229	24.041	26.515	1.207	14.073	15.351	0.410	<b>11.837</b>	<b>12.992</b>	0.315
	3	13.463	14.832	<b>0.315</b>	24.580	27.481	1.521	24.314	27.184	1.517	14.283	15.889	0.487	<b>12.484</b>	<b>13.847</b>	0.382
	4	<b>7.395</b>	<b>8.135</b>	<b>0.131</b>	28.734	31.872	1.650	27.714	30.852	1.630	14.706	16.346	0.531	12.333	13.684	0.363
	5	47.050	52.107	2.932	30.348	33.640	1.408	<b>29.052</b>	<b>32.192</b>	<b>1.291</b>	58.519	63.964	3.717	58.908	64.309	3.716
	6	<b>33.220</b>	<b>34.905</b>	<b>1.281</b>	36.447	39.499	2.006	36.833	39.901	2.023	37.022	38.856	1.548	35.661	37.733	1.587
	7	<b>8.917</b>	<b>9.674</b>	<b>0.143</b>	23.392	25.781	1.187	22.938	25.312	1.184	11.866	12.908	0.313	10.020	10.850	0.214
	8	<b>8.705</b>	<b>9.454</b>	<b>0.168</b>	23.725	26.067	1.162	23.497	25.828	1.170	12.519	13.578	0.342	10.400	11.254	0.234

**Note:** (1). All values are the average value of 3 experiments; (2). For intuitive display, all values have been magnified 1000 times.

Table C.14: The results of XJTU battery dataset, the input type is partial charging data with  $[0, 1]$  normalization. The best result was **bolded**.

Model		CNN			LSTM			GRU			MLP			Attention		
Batch	Battery	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
1	1	5.362	5.835	0.049	5.671	6.345	0.075	4.917	5.500	0.059	<b>4.237</b>	<b>4.546</b>	<b>0.028</b>	6.613	7.284	0.090
	2	<b>5.908</b>	<b>6.607</b>	<b>0.069</b>	6.822	7.789	0.118	6.847	7.787	0.119	8.678	9.461	0.104	12.158	13.495	0.249
	3	8.901	9.831	0.115	<b>8.533</b>	<b>9.694</b>	0.153	8.677	9.817	0.145	9.193	10.147	<b>0.111</b>	11.502	12.965	0.272
	4	<b>4.393</b>	<b>4.878</b>	<b>0.038</b>	7.778	8.746	0.127	6.671	7.490	0.095	6.491	7.040	0.062	15.669	17.774	0.490
	5	<b>4.103</b>	<b>4.513</b>	<b>0.027</b>	9.269	10.205	0.119	8.065	8.884	0.090	4.262	4.851	0.045	16.085	17.523	0.354
	6	<b>4.039</b>	<b>4.409</b>	<b>0.025</b>	10.670	11.540	0.135	9.465	10.219	0.105	6.418	6.945	0.052	10.582	11.515	0.149
	7	<b>7.023</b>	<b>7.718</b>	<b>0.079</b>	14.126	15.087	0.223	13.743	14.617	0.209	13.654	14.515	0.208	16.605	17.761	0.377
	8	<b>5.896</b>	<b>6.518</b>	<b>0.061</b>	7.947	8.660	0.088	8.588	9.284	0.094	15.457	16.683	0.257	8.983	9.996	0.135
2	1	4.644	4.940	0.034	7.372	7.823	0.075	7.389	7.832	0.070	4.533	4.931	0.034	<b>4.115</b>	<b>4.414</b>	<b>0.023</b>
	2	<b>14.967</b>	<b>15.695</b>	<b>0.258</b>	25.896	27.295	0.723	25.536	26.937	0.699	22.608	24.029	0.539	17.825	18.580	0.404
	3	18.466	19.400	0.903	13.000	13.989	0.210	<b>10.915</b>	<b>11.838</b>	<b>0.158</b>	13.100	13.723	0.192	12.764	14.061	0.309
	4	8.433	9.306	0.142	5.023	5.411	0.038	<b>4.708</b>	<b>5.064</b>	<b>0.032</b>	7.279	7.747	0.071	20.955	23.164	0.575
	5	22.258	23.583	1.272	7.976	8.932	0.121	5.856	6.566	0.071	<b>3.731</b>	<b>3.981</b>	<b>0.023</b>	13.564	14.676	0.306
	6	40.302	42.619	2.345	17.246	18.507	0.374	16.125	17.314	0.323	12.231	13.477	0.255	<b>10.343</b>	<b>10.976</b>	<b>0.140</b>
	7	5.629	5.989	0.068	7.880	8.595	0.094	6.466	7.018	0.065	<b>4.779</b>	<b>5.082</b>	<b>0.032</b>	10.216	11.249	0.152
	8	<b>2.896</b>	<b>3.102</b>	<b>0.014</b>	5.667	5.962	0.054	5.271	5.558	0.046	4.105	4.405	0.031	3.598	3.806	0.023
	9	12.155	13.370	0.210	10.026	11.410	0.199	10.526	11.825	0.174	<b>5.887</b>	<b>6.575</b>	<b>0.055</b>	7.959	8.881	0.110
	10	10.790	11.653	0.209	8.089	9.122	0.136	6.135	6.958	0.094	<b>5.564</b>	<b>6.314</b>	<b>0.073</b>	17.109	18.689	0.362
	11	14.279	15.582	0.413	17.495	19.549	0.432	17.835	19.779	0.402	16.878	18.602	0.318	<b>9.085</b>	<b>10.148</b>	<b>0.132</b>
	12	16.800	18.109	0.631	13.175	14.687	0.262	14.831	16.381	0.282	11.291	12.390	<b>0.147</b>	<b>10.672</b>	<b>12.063</b>	0.285

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Model		CNN			LSTM			GRU			MLP			Attention		
Batch	Battery	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
	13	12.835	14.177	0.289	7.508	8.541	0.151	7.421	8.354	0.126	<b>5.496</b>	<b>6.152</b>	<b>0.055</b>	10.547	11.558	0.183
	14	8.786	<b>9.518</b>	<b>0.102</b>	10.684	12.089	0.215	10.649	11.941	0.185	<b>8.752</b>	9.801	0.113	16.081	17.610	0.411
	15	<b>5.332</b>	<b>5.972</b>	<b>0.048</b>	19.498	21.903	0.494	19.081	21.287	0.431	18.296	20.338	0.368	11.449	12.995	0.220
3	1	<b>4.489</b>	<b>4.821</b>	<b>0.031</b>	9.554	10.463	0.141	9.022	9.896	0.128	7.663	8.291	0.091	9.275	10.207	0.152
	2	<b>4.863</b>	<b>5.166</b>	<b>0.040</b>	8.009	8.709	0.094	7.596	8.273	0.085	6.548	7.051	0.069	6.603	7.239	0.073
	3	6.241	6.693	0.061	4.715	4.994	0.033	<b>4.406</b>	<b>4.647</b>	<b>0.029</b>	7.149	7.571	0.076	6.732	7.075	0.079
	4	<b>6.479</b>	<b>6.853</b>	<b>0.065</b>	10.194	10.690	0.143	9.722	10.220	0.131	9.376	9.841	0.129	11.284	12.145	0.205
	5	<b>4.751</b>	<b>5.011</b>	<b>0.036</b>	7.732	8.369	0.087	7.573	8.209	0.084	7.075	7.572	0.081	9.207	9.781	0.131
	6	6.557	7.044	0.073	6.524	7.078	0.069	6.589	7.164	0.072	<b>6.033</b>	<b>6.426</b>	<b>0.058</b>	7.160	7.699	0.086
	7	6.481	6.992	0.073	5.468	5.835	0.050	<b>5.254</b>	<b>5.596</b>	<b>0.047</b>	5.578	5.923	0.050	5.886	6.192	0.063
	8	5.818	6.213	0.069	5.338	5.645	0.042	<b>5.298</b>	<b>5.590</b>	<b>0.040</b>	5.442	5.761	0.049	11.345	12.193	0.250
4	1	<b>6.851</b>	<b>7.489</b>	<b>0.087</b>	11.580	12.941	0.262	11.296	12.575	0.240	10.065	11.037	0.158	9.524	10.606	0.186
	2	<b>6.081</b>	<b>6.581</b>	<b>0.064</b>	11.711	12.782	0.223	11.391	12.410	0.204	9.333	10.154	0.140	12.107	13.020	0.202
	3	<b>9.294</b>	<b>10.361</b>	0.181	12.388	13.701	0.279	11.869	13.085	0.246	10.940	11.933	<b>0.178</b>	12.069	13.378	0.290
	4	<b>10.055</b>	<b>10.734</b>	<b>0.129</b>	13.607	14.693	0.272	13.357	14.389	0.259	11.699	12.567	0.181	11.955	12.791	0.203
	5	<b>6.588</b>	<b>7.163</b>	<b>0.070</b>	9.938	10.918	0.175	10.091	11.034	0.166	8.594	9.326	0.116	9.239	9.979	0.130
	6	<b>6.057</b>	<b>6.582</b>	<b>0.066</b>	11.733	12.667	0.198	11.975	12.909	0.199	10.524	11.320	0.157	11.329	12.187	0.198
	7	8.199	8.839	<b>0.104</b>	9.756	10.665	0.176	9.989	10.872	0.174	<b>7.745</b>	<b>8.389</b>	0.122	8.398	9.064	0.124
	8	11.574	12.728	0.242	12.033	13.087	0.214	12.360	13.393	0.215	<b>10.482</b>	<b>11.344</b>	<b>0.156</b>	11.536	12.483	0.237
5	1	<b>10.987</b>	<b>12.011</b>	<b>0.210</b>	32.281	36.039	1.729	32.361	36.093	1.714	13.647	14.813	0.293	16.344	17.740	0.399
	2	18.834	20.345	0.587	32.569	35.988	1.752	32.740	36.089	1.717	<b>15.122</b>	<b>16.686</b>	<b>0.371</b>	15.991	17.870	0.479
	3	<b>11.743</b>	<b>13.018</b>	<b>0.234</b>	36.560	41.103	2.229	37.130	41.596	2.209	15.227	16.930	0.377	25.608	28.793	1.142
	4	26.322	28.369	0.902	37.201	41.590	2.310	37.902	42.318	2.323	<b>15.150</b>	<b>16.359</b>	<b>0.356</b>	16.058	17.386	0.390
	5	<b>14.311</b>	<b>16.039</b>	<b>0.395</b>	37.282	42.152	2.367	37.087	41.984	2.393	18.584	20.899	0.554	17.485	19.871	0.567
	6	<b>11.585</b>	<b>12.591</b>	<b>0.222</b>	35.416	39.583	2.040	35.570	39.805	2.059	13.764	15.003	0.300	18.324	19.775	0.500
	7	17.197	18.547	0.486	32.966	36.701	1.828	34.608	38.362	1.843	<b>13.894</b>	<b>14.933</b>	<b>0.313</b>	16.823	18.065	0.411
	8	14.654	16.370	0.420	40.691	46.270	2.868	39.846	45.465	2.857	13.206	14.517	0.285	<b>12.833</b>	<b>14.130</b>	<b>0.271</b>
6	1	<b>26.087</b>	<b>27.920</b>	<b>0.951</b>	36.809	40.245	2.275	35.486	39.021	2.280	31.167	34.044	1.571	33.742	36.996	1.972
	2	<b>17.345</b>	<b>18.763</b>	<b>0.550</b>	31.696	34.363	1.701	34.626	37.278	1.788	30.288	32.428	1.282	30.415	32.824	1.418
	3	<b>11.265</b>	<b>12.467</b>	<b>0.294</b>	31.700	34.731	1.858	30.244	33.307	1.795	23.462	26.018	1.199	26.888	29.706	1.509
	4	<b>11.384</b>	<b>12.681</b>	<b>0.316</b>	32.854	36.178	2.001	31.792	35.169	1.979	25.931	28.749	1.362	27.399	30.187	1.453
	5	<b>24.528</b>	<b>27.353</b>	<b>0.982</b>	35.536	39.643	1.966	34.645	38.813	1.946	30.956	34.794	1.603	29.206	32.839	1.536
	6	<b>22.597</b>	<b>23.881</b>	<b>0.660</b>	41.996	45.163	2.541	41.053	44.310	2.498	31.275	34.065	1.641	39.383	42.464	2.241
	7	<b>12.680</b>	<b>14.048</b>	<b>0.397</b>	28.545	31.152	1.470	27.290	29.891	1.404	20.632	22.764	0.919	23.034	25.367	1.098
	8	<b>13.389</b>	<b>14.659</b>	<b>0.384</b>	28.317	30.825	1.431	28.613	31.097	1.425	25.911	27.947	1.066	22.939	24.822	0.942

**Note:** (1). All values are the average value of 3 experiments; (2). For intuitive display, all values have been magnified 1000 times.

Table C.15: The results of XJTU battery dataset, the input type is handcraft features with  $[0, 1]$  normalization. The best result was **bolded**.

Model		CNN			LSTM			GRU			MLP			Attention		
Batch	Battery	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
1	1	56.334	60.066	3.263	5.571	6.070	0.049	<b>5.015</b>	<b>5.524</b>	<b>0.042</b>	5.552	6.047	0.056	8.139	8.846	0.096
	2	39.130	41.963	2.205	5.972	6.712	0.067	<b>4.350</b>	<b>4.841</b>	<b>0.035</b>	4.843	5.313	0.058	6.406	7.038	0.061
	3	22.578	24.424	0.869	5.631	6.330	0.075	<b>4.552</b>	<b>5.083</b>	<b>0.046</b>	7.112	7.696	0.088	6.729	7.388	0.088
	4	19.109	20.449	0.901	4.816	5.319	0.037	<b>3.074</b>	<b>3.284</b>	<b>0.015</b>	5.143	5.610	0.048	7.066	7.580	0.069
	5	13.643	14.392	0.459	4.365	4.909	0.038	<b>2.786</b>	<b>3.096</b>	<b>0.014</b>	4.575	4.977	0.036	7.424	7.973	0.073
	6	55.811	59.079	3.831	4.024	4.474	0.032	<b>3.617</b>	<b>3.950</b>	<b>0.021</b>	6.225	6.757	0.065	6.146	6.698	0.053
	7	6.666	7.079	0.063	7.326	7.896	0.076	7.275	7.766	0.063	12.449	13.126	0.206	<b>6.161</b>	<b>6.670</b>	<b>0.053</b>
	8	5.599	6.158	0.079	3.976	4.389	0.031	<b>3.721</b>	<b>4.001</b>	<b>0.020</b>	8.138	8.749	0.097	6.065	6.510	0.059
2	1	13.441	14.411	0.409	5.457	5.790	0.042	3.913	4.176	<b>0.025</b>	<b>3.856</b>	<b>4.117</b>	0.029	5.979	6.440	0.052
	2	38.114	40.036	2.918	12.846	13.473	0.216	12.825	13.519	0.190	15.330	16.147	0.257	<b>10.655</b>	<b>11.326</b>	<b>0.173</b>
	3	18.222	19.417	0.494	19.633	20.640	0.469	17.309	18.154	0.364	<b>16.303</b>	<b>17.036</b>	<b>0.310</b>	18.762	19.841	0.461
	4	19.990	21.461	0.540	6.287	6.745	0.058	4.674	5.037	0.038	<b>4.210</b>	<b>4.546</b>	<b>0.034</b>	8.516	9.185	0.115
	5	5.796	6.234	0.040	5.973	6.270	0.053	4.042	4.269	<b>0.027</b>	<b>3.789</b>	<b>4.058</b>	0.029	4.692	4.997	0.037
	6	<b>3.541</b>	<b>3.901</b>	<b>0.027</b>	7.513	8.060	0.081	5.953	6.395	0.053	5.093	5.393	0.046	6.031	6.573	0.081
	7	54.278	57.303	4.250	6.830	7.142	0.067	5.918	6.279	0.050	7.248	7.884	0.082	<b>4.900</b>	<b>5.186</b>	<b>0.038</b>
	8	36.197	38.468	2.260	<b>9.725</b>	<b>10.330</b>	<b>0.127</b>	10.175	10.893	0.131	11.161	11.954	0.158	11.448	12.291	0.189
	9	26.113	28.400	0.833	9.972	11.074	0.134	12.741	13.906	0.181	19.988	21.590	0.467	<b>9.593</b>	<b>10.502</b>	<b>0.112</b>
	10	8.067	8.818	0.147	8.567	9.727	0.151	<b>6.368</b>	<b>7.192</b>	0.080	6.377	<b>7.059</b>	<b>0.075</b>	7.821	8.845	0.127
	11	41.360	45.040	2.323	12.407	13.703	0.188	10.033	11.045	0.125	<b>7.737</b>	<b>8.489</b>	<b>0.102</b>	12.844	14.027	0.191

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Model		CNN			LSTM			GRU			MLP			Attention		
Batch	Battery	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
	12	40.239	43.483	2.452	8.465	9.241	0.089	7.640	8.239	<b>0.081</b>	<b>6.692</b>	<b>7.212</b>	0.085	11.368	12.353	0.163
	13	32.607	35.123	2.057	4.006	4.463	<b>0.038</b>	<b>3.662</b>	<b>4.034</b>	0.039	5.339	5.858	0.088	6.098	6.679	0.060
	14	31.382	34.021	2.000	13.556	14.988	0.212	9.554	10.542	<b>0.113</b>	<b>8.070</b>	<b>8.877</b>	0.114	11.621	12.729	0.145
	15	51.130	55.801	2.973	19.109	21.280	0.420	16.839	18.636	0.306	<b>14.403</b>	<b>15.926</b>	<b>0.255</b>	21.884	24.106	0.499
3	1	5.591	5.956	0.049	6.431	7.059	0.068	4.609	4.984	0.033	3.870	4.105	0.025	<b>3.393</b>	<b>3.666</b>	<b>0.022</b>
	2	4.258	4.667	0.030	5.524	6.124	0.058	3.681	4.038	0.027	<b>3.407</b>	<b>3.679</b>	<b>0.022</b>	4.974	5.434	0.045
	3	<b>3.185</b>	<b>3.388</b>	<b>0.016</b>	4.874	5.133	0.035	4.463	4.743	0.027	3.641	3.876	0.022	10.438	10.959	0.139
	4	31.503	33.175	2.310	10.276	10.731	0.133	8.660	8.949	0.099	7.798	8.094	0.080	<b>6.250</b>	<b>6.627</b>	<b>0.061</b>
	5	4.111	4.347	0.029	5.603	6.100	0.051	3.997	4.314	0.026	<b>3.407</b>	<b>3.638</b>	<b>0.020</b>	4.962	5.344	0.038
	6	6.071	6.492	0.056	<b>3.658</b>	<b>3.926</b>	0.023	3.873	4.119	<b>0.022</b>	6.858	7.309	0.061	4.795	5.033	0.034
	7	8.765	9.224	0.105	4.130	4.432	0.035	3.151	3.373	0.019	<b>3.079</b>	<b>3.287</b>	<b>0.018</b>	6.520	6.919	0.071
	8	19.074	20.172	0.752	2.751	2.908	0.012	<b>2.533</b>	<b>2.724</b>	<b>0.011</b>	3.826	4.134	0.025	4.182	4.417	0.027
4	1	21.220	22.695	0.854	5.034	5.650	0.062	<b>4.542</b>	5.005	0.040	4.574	<b>4.991</b>	<b>0.037</b>	5.155	5.637	0.045
	2	<b>4.382</b>	<b>4.719</b>	<b>0.031</b>	9.164	9.874	0.116	8.214	8.775	0.083	7.576	8.079	0.071	6.644	7.189	0.069
	3	5.229	5.539	0.044	8.819	9.544	0.109	6.988	7.489	0.067	6.555	6.984	0.059	<b>4.753</b>	<b>5.141</b>	<b>0.041</b>
	4	7.414	7.786	0.067	6.369	6.899	0.063	5.002	5.398	0.039	<b>4.273</b>	<b>4.614</b>	<b>0.031</b>	4.546	4.899	0.037
	5	4.665	4.970	0.032	4.759	5.157	0.040	4.577	4.927	0.034	<b>4.227</b>	<b>4.555</b>	<b>0.030</b>	7.297	7.829	0.078
	6	6.225	6.731	0.054	4.994	5.406	0.044	<b>4.269</b>	<b>4.625</b>	<b>0.035</b>	4.472	4.840	0.037	6.376	6.865	0.066
	7	12.230	13.177	0.187	<b>7.894</b>	<b>8.577</b>	<b>0.086</b>	8.439	9.069	0.093	8.227	8.827	0.088	9.183	9.874	0.105
	8	<b>3.916</b>	<b>4.296</b>	<b>0.027</b>	5.331	5.867	0.061	4.186	4.594	0.037	4.036	4.412	0.032	4.167	4.562	0.033
5	1	38.158	41.378	1.898	<b>9.303</b>	<b>10.162</b>	0.165	9.861	10.808	<b>0.161</b>	12.304	13.414	0.259	10.433	11.567	0.227
	2	60.343	64.647	3.844	9.445	10.198	0.145	8.467	9.105	<b>0.123</b>	13.625	14.714	0.289	<b>8.029</b>	<b>8.755</b>	0.136
	3	17.078	18.788	0.531	12.087	13.548	0.255	<b>9.729</b>	<b>10.998</b>	<b>0.196</b>	11.257	12.574	0.223	10.354	11.642	0.228
	4	55.587	59.777	3.338	6.988	7.686	0.126	<b>6.616</b>	<b>7.276</b>	<b>0.116</b>	11.110	12.098	0.264	7.084	7.831	0.133
	5	28.253	30.457	1.148	<b>11.188</b>	<b>12.598</b>	0.232	11.885	13.207	<b>0.214</b>	15.173	16.611	0.299	13.976	15.487	0.303
	6	29.356	31.716	1.302	6.839	7.607	0.116	<b>6.541</b>	<b>7.233</b>	<b>0.094</b>	9.479	10.358	0.174	7.869	8.719	0.139
	7	28.969	31.173	1.340	11.055	11.925	0.168	13.982	15.075	0.238	23.128	24.956	0.686	<b>8.208</b>	<b>8.979</b>	<b>0.128</b>
	8	18.911	20.516	0.616	12.383	14.166	0.307	<b>11.904</b>	<b>13.493</b>	<b>0.242</b>	14.615	16.303	0.340	13.566	15.182	0.316
6	1	<b>6.134</b>	<b>6.695</b>	<b>0.083</b>	14.558	15.899	0.337	13.345	14.529	0.275	12.443	13.555	0.249	7.240	7.910	0.116
	2	<b>8.008</b>	<b>8.679</b>	<b>0.125</b>	9.958	10.788	0.190	10.264	11.070	0.192	10.834	11.658	0.201	10.611	11.400	0.181
	3	<b>7.427</b>	<b>8.031</b>	<b>0.086</b>	17.852	19.485	0.811	9.533	10.427	0.180	9.208	10.053	0.164	9.115	9.907	0.145
	4	14.303	15.163	0.241	19.749	21.710	0.903	11.522	12.655	0.238	<b>11.075</b>	<b>12.140</b>	0.212	11.623	12.570	<b>0.196</b>
	5	22.722	24.772	0.600	17.309	18.983	0.392	13.796	15.095	0.264	<b>13.604</b>	<b>14.857</b>	<b>0.257</b>	18.130	19.743	0.431
	6	<b>7.729</b>	<b>8.376</b>	<b>0.139</b>	31.532	33.971	1.832	12.415	13.596	0.326	11.478	12.616	0.301	10.272	11.321	0.257
	7	<b>5.984</b>	<b>6.459</b>	<b>0.075</b>	16.392	17.849	0.641	8.570	9.363	0.153	8.379	9.129	0.143	6.922	7.511	0.100
	8	<b>5.308</b>	<b>5.708</b>	<b>0.059</b>	10.580	11.459	0.196	10.012	10.829	0.169	9.622	10.400	0.154	7.996	8.649	0.112

**Note:** (1). All values are the average value of 3 experiments; (2). For intuitive display, all values have been magnified 1000 times.

Table C.16: The results of XJTU battery dataset, the input type is complete charging data with z-score normalization. The best result was **bolded**.

Model		CNN			LSTM			GRU			MLP			Attention		
Batch	Battery	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
1	1	20.940	22.688	0.931	18.761	20.738	0.630	22.025	24.301	0.806	11.578	12.261	0.167	<b>4.419</b>	<b>4.750</b>	<b>0.029</b>
	2	41.649	45.074	2.196	20.589	23.179	0.825	24.575	27.535	1.070	5.498	6.031	0.051	<b>5.060</b>	<b>5.545</b>	<b>0.044</b>
	3	24.410	26.547	0.821	20.028	22.835	0.863	21.786	24.901	1.033	9.133	10.275	0.138	<b>5.449</b>	<b>5.933</b>	<b>0.065</b>
	4	7.668	8.389	0.114	21.748	24.404	0.911	24.325	27.223	1.056	<b>4.873</b>	<b>5.245</b>	<b>0.035</b>	9.722	10.808	0.190
	5	6.402	6.995	0.059	21.679	24.296	0.880	23.571	26.486	1.009	4.326	4.662	0.028	<b>3.759</b>	<b>4.134</b>	<b>0.026</b>
	6	12.025	13.080	0.320	18.582	21.015	0.756	21.580	24.520	1.064	7.591	8.115	0.068	<b>4.862</b>	<b>5.389</b>	<b>0.044</b>
	7	21.941	23.478	0.690	23.437	26.013	0.909	28.900	31.961	1.234	10.242	11.003	<b>0.134</b>	<b>8.927</b>	<b>9.595</b>	0.137
	8	39.339	42.432	1.884	20.792	22.946	0.791	23.621	26.160	0.931	12.254	13.128	<b>0.194</b>	<b>11.523</b>	<b>12.708</b>	0.206
2	1	<b>6.513</b>	<b>7.166</b>	0.111	15.587	16.624	0.318	21.138	23.057	0.635	8.740	9.229	0.101	8.428	9.027	<b>0.094</b>
	2	66.513	70.951	4.933	20.113	21.091	0.612	31.859	33.408	1.406	31.748	33.777	1.039	<b>16.633</b>	<b>17.682</b>	<b>0.376</b>
	3	29.461	31.308	1.611	24.176	26.497	0.843	29.623	32.660	1.356	<b>20.460</b>	<b>21.471</b>	<b>0.670</b>	26.327	27.945	1.263
	4	26.816	28.698	1.433	19.435	21.291	0.626	26.218	29.329	1.117	20.609	22.228	0.455	<b>12.961</b>	<b>14.089</b>	<b>0.241</b>
	5	30.508	32.626	2.223	19.796	21.601	0.546	24.919	27.463	0.939	<b>4.046</b>	<b>4.266</b>	<b>0.025</b>	12.183	13.648	0.609
	6	17.946	19.300	0.737	16.602	18.026	0.426	18.032	19.730	0.586	9.345	10.333	<b>0.178</b>	<b>9.255</b>	<b>10.113</b>	0.183
	7	19.602	21.080	0.434	24.377	27.239	1.066	29.539	33.292	1.665	<b>17.662</b>	<b>18.750</b>	<b>0.364</b>	18.414	19.656	0.554
	8	28.388	30.021	1.656	30.016	31.400	1.298	40.005	41.697	2.089	39.574	41.983	1.579	<b>13.943</b>	<b>15.029</b>	<b>0.306</b>
	9	10.385	11.224	0.233	26.568	30.237	1.478	28.004	31.856	1.639	33.549	36.694	1.148	<b>10.030</b>	<b>11.120</b>	<b>0.157</b>
	10	<b>5.818</b>	<b>6.244</b>	<b>0.053</b>	36.910	40.613	1.752	39.478	43.173	1.963	6.276	6.828	0.074	11.714	12.861	0.198

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Model		CNN			LSTM			GRU			MLP			Attention		
Batch	Battery	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
	11	17.674	19.340	0.751	32.502	36.080	1.478	41.318	45.079	2.056	17.847	19.354	0.424	<b>6.899</b>	<b>7.541</b>	<b>0.081</b>
	12	<b>5.286</b>	5.791	<b>0.038</b>	24.598	27.345	0.948	26.847	29.817	1.151	15.489	16.894	0.261	5.288	<b>5.771</b>	0.044
	13	33.507	36.046	2.279	25.984	29.312	1.376	27.324	30.811	1.513	<b>15.527</b>	<b>16.918</b>	<b>0.259</b>	17.004	18.814	0.579
	14	<b>5.689</b>	<b>6.366</b>	<b>0.068</b>	40.253	43.956	2.158	44.551	48.552	2.465	6.861	7.566	0.072	7.735	8.414	0.091
	15	9.841	10.755	0.159	41.108	45.581	2.205	40.553	44.862	2.101	15.610	17.386	0.298	<b>5.863</b>	<b>6.573</b>	<b>0.062</b>
3	1	<b>7.178</b>	<b>7.694</b>	<b>0.108</b>	30.151	33.725	1.834	33.116	37.323	2.338	20.174	21.937	0.514	8.509	9.378	0.122
	2	4.331	4.709	0.036	30.678	34.286	1.880	34.601	38.548	2.181	7.181	7.884	0.087	<b>4.055</b>	<b>4.365</b>	<b>0.027</b>
	3	17.780	18.765	0.641	28.550	30.968	1.302	29.962	32.385	1.358	18.766	20.274	0.466	<b>10.434</b>	<b>11.447</b>	<b>0.185</b>
	4	4.592	4.876	<b>0.033</b>	29.122	32.296	1.648	34.422	37.822	1.941	11.186	11.653	0.182	<b>4.552</b>	<b>4.837</b>	0.034
	5	<b>5.405</b>	<b>5.804</b>	<b>0.049</b>	28.701	31.892	1.660	32.265	36.123	2.159	9.948	10.552	0.140	8.403	8.804	0.092
	6	11.137	11.889	0.246	26.052	29.171	1.411	28.759	32.264	1.700	8.814	9.373	0.112	<b>5.629</b>	<b>6.123</b>	<b>0.062</b>
	7	<b>4.699</b>	<b>5.085</b>	<b>0.045</b>	22.787	25.280	1.188	28.710	31.536	1.501	6.033	6.385	0.058	5.606	6.011	0.048
	8	<b>2.710</b>	<b>2.859</b>	<b>0.012</b>	23.527	25.899	1.159	27.312	29.859	1.311	7.769	8.344	0.099	5.761	6.329	0.075
4	1	<b>6.199</b>	<b>6.697</b>	<b>0.058</b>	24.689	28.071	1.461	25.594	29.235	1.657	10.973	12.222	0.223	11.122	12.257	0.198
	2	11.433	12.172	0.169	25.155	27.849	1.325	27.174	29.943	1.352	13.701	14.507	0.233	<b>5.783</b>	<b>6.404</b>	<b>0.083</b>
	3	<b>7.723</b>	<b>8.234</b>	<b>0.083</b>	29.074	32.183	1.500	29.938	33.170	1.571	12.097	12.907	0.196	9.970	10.973	0.187
	4	<b>5.886</b>	<b>6.245</b>	<b>0.049</b>	29.914	32.638	1.367	31.586	34.353	1.453	7.276	7.907	0.088	13.020	13.853	0.219
	5	7.297	7.846	0.069	20.277	22.713	0.932	21.904	24.534	1.042	6.312	6.804	0.067	<b>5.875</b>	<b>6.389</b>	<b>0.057</b>
	6	<b>5.502</b>	<b>6.011</b>	<b>0.056</b>	20.433	22.623	0.945	20.898	23.131	0.967	7.007	7.604	0.082	6.042	6.625	0.080
	7	9.619	10.646	0.269	21.274	23.637	0.903	23.380	25.839	0.990	<b>4.982</b>	<b>5.498</b>	<b>0.055</b>	6.354	6.983	0.075
	8	8.873	9.508	0.172	22.145	24.615	1.049	24.582	27.258	1.171	7.117	7.682	0.077	<b>5.930</b>	<b>6.515</b>	<b>0.070</b>
5	1	13.497	14.786	0.380	33.612	37.324	1.722	33.249	36.999	1.726	<b>9.580</b>	<b>10.524</b>	<b>0.216</b>	11.682	12.849	0.455
	2	24.612	26.333	0.956	31.510	34.912	1.691	31.418	34.838	1.701	13.608	14.883	0.285	<b>13.202</b>	<b>14.255</b>	<b>0.266</b>
	3	28.420	30.725	1.146	36.616	41.069	2.199	35.815	40.349	2.218	18.388	20.661	0.546	<b>10.865</b>	<b>12.009</b>	<b>0.177</b>
	4	28.211	30.738	1.013	37.307	41.753	2.322	37.378	41.835	2.333	<b>8.802</b>	<b>9.697</b>	<b>0.224</b>	10.194	11.299	0.260
	5	28.567	31.199	1.211	37.563	42.388	2.359	37.522	42.343	2.354	<b>9.835</b>	<b>10.927</b>	<b>0.187</b>	13.051	14.473	0.263
	6	38.229	41.458	1.661	35.983	40.210	2.070	35.641	39.885	2.064	<b>8.992</b>	<b>9.909</b>	<b>0.186</b>	11.346	12.537	0.272
	7	<b>9.227</b>	<b>10.160</b>	<b>0.166</b>	34.568	38.289	1.855	34.017	37.755	1.840	17.052	18.389	0.411	11.361	12.513	0.245
	8	<b>11.626</b>	<b>12.797</b>	<b>0.246</b>	41.178	46.727	2.865	41.053	46.620	2.872	21.091	23.123	0.575	12.010	13.286	0.297
6	1	<b>11.870</b>	<b>12.940</b>	<b>0.264</b>	33.817	37.119	1.900	35.241	38.570	2.002	17.708	19.484	0.671	14.821	16.176	0.399
	2	<b>12.158</b>	<b>13.025</b>	<b>0.237</b>	28.495	30.900	1.319	27.696	30.083	1.262	13.207	14.304	0.393	13.720	14.648	0.336
	3	<b>9.738</b>	<b>10.498</b>	<b>0.194</b>	24.024	26.869	1.434	24.628	27.507	1.522	13.853	15.388	0.517	11.898	13.106	0.291
	4	<b>8.529</b>	<b>9.453</b>	<b>0.182</b>	27.613	30.703	1.549	28.331	31.505	1.664	13.927	15.526	0.528	9.591	10.656	0.248
	5	<b>19.172</b>	<b>21.204</b>	<b>0.487</b>	27.152	30.566	1.334	27.285	30.630	1.236	26.507	29.295	0.962	23.476	25.829	0.750
	6	<b>25.864</b>	<b>27.249</b>	<b>0.864</b>	39.525	42.523	2.138	42.229	45.260	2.317	38.121	40.272	1.773	38.263	40.286	1.689
	7	<b>8.482</b>	<b>9.185</b>	<b>0.141</b>	22.541	24.956	1.163	23.940	26.429	1.256	12.814	14.085	0.424	9.965	10.865	0.221
	8	<b>6.397</b>	<b>6.874</b>	<b>0.092</b>	23.048	25.333	1.118	24.503	26.838	1.177	12.040	13.182	0.375	8.696	9.466	0.182

**Note:** (1). All values are the average value of 3 experiments; (2). For intuitive display, all values have been magnified 1000 times.

Table C.17: The results of XJTU battery dataset, the input type is partial charging data with z-score normalization. The best result was **bolded**.

Model		CNN			LSTM			GRU			MLP			Attention		
Batch	Battery	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
1	1	<b>37.159</b>	<b>40.363</b>	<b>2.297</b>	43.328	46.822	2.501	41.250	45.074	2.385	188.645	203.889	70.879	54.523	58.021	3.872
	2	44.277	48.608	3.238	44.317	48.874	3.166	<b>43.217</b>	<b>48.025</b>	<b>2.788</b>	253.010	272.465	100.252	54.476	59.438	4.744
	3	38.633	43.284	2.700	<b>36.365</b>	<b>40.839</b>	<b>2.340</b>	45.481	50.570	2.952	265.292	287.846	91.952	43.605	47.510	2.980
	4	<b>37.711</b>	<b>41.953</b>	<b>2.740</b>	46.843	51.064	3.209	43.010	47.818	2.816	264.607	285.843	109.045	40.802	45.117	2.764
	5	32.527	36.018	1.849	<b>27.514</b>	<b>31.375</b>	1.702	46.447	51.370	3.040	288.385	315.535	194.314	28.945	32.409	<b>1.549</b>
	6	31.451	34.634	1.785	32.157	35.843	1.882	44.852	49.472	2.805	308.574	332.831	167.666	<b>28.800</b>	<b>31.286</b>	<b>1.327</b>
	7	<b>38.353</b>	<b>42.968</b>	3.047	40.630	44.660	<b>2.515</b>	46.919	51.627	3.013	321.954	349.131	154.645	62.306	66.912	5.423
	8	30.801	34.640	2.136	<b>27.946</b>	<b>31.821</b>	2.192	41.264	45.230	2.409	411.139	442.260	262.386	32.027	35.407	<b>1.915</b>
2	1	<b>33.679</b>	<b>36.942</b>	1.992	36.388	39.674	2.007	36.206	39.559	2.000	182.682	194.596	46.521	35.434	38.251	<b>1.785</b>
	2	42.562	45.467	2.656	<b>41.141</b>	<b>43.949</b>	<b>2.288</b>	41.747	44.606	2.338	180.985	189.956	49.078	61.478	64.418	4.619
	3	45.792	49.506	2.971	51.517	54.940	3.398	56.247	60.658	6.389	263.190	276.951	111.744	<b>43.928</b>	<b>47.097</b>	<b>2.862</b>
	4	<b>34.177</b>	37.962	1.944	35.116	39.019	2.050	34.945	38.993	2.123	204.320	217.950	64.406	34.405	<b>37.222</b>	<b>1.656</b>
	5	51.156	57.058	4.567	<b>36.273</b>	<b>40.041</b>	2.194	37.011	40.706	<b>2.174</b>	492.457	534.130	425.592	37.483	42.130	2.922
	6	41.917	45.286	2.503	39.009	42.099	2.043	<b>36.168</b>	<b>39.252</b>	<b>1.881</b>	129.848	137.525	25.241	73.835	78.224	7.533
	7	70.524	74.473	6.247	47.882	52.272	<b>3.108</b>	49.360	53.692	3.228	493.184	548.123	554.507	<b>41.409</b>	<b>46.178</b>	3.442
	8	33.210	35.666	1.757	<b>32.341</b>	<b>34.814</b>	<b>1.569</b>	33.551	36.197	1.700	250.698	267.941	90.520	55.479	58.531	4.459
	9	37.418	42.240	2.691	32.438	36.284	<b>1.708</b>	<b>31.333</b>	<b>35.484</b>	1.869	126.580	137.696	25.190	52.907	57.435	4.506

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Model		CNN			LSTM			GRU			MLP			Attention		
Batch	Battery	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
	10	35.616	39.974	2.443	31.230	35.188	1.917	<b>30.128</b>	<b>33.947</b>	<b>1.754</b>	197.854	212.958	50.711	40.826	45.351	2.716
	11	50.851	56.647	4.858	<b>29.267</b>	<b>33.569</b>	<b>2.133</b>	30.484	34.813	2.218	814.103	895.257	-	76.329	85.090	9.587
	12	33.605	37.372	1.947	30.933	34.543	1.658	<b>28.081</b>	<b>31.546</b>	<b>1.518</b>	140.223	152.170	28.093	38.382	42.039	2.001
	13	38.763	42.729	2.409	<b>29.598</b>	33.770	2.173	29.642	<b>33.374</b>	<b>1.742</b>	241.006	259.553	98.645	91.022	99.347	12.974
	14	40.123	45.059	3.117	27.957	31.643	<b>1.595</b>	<b>27.740</b>	<b>31.549</b>	1.611	201.605	222.334	58.881	48.616	53.784	3.679
	15	36.267	41.367	2.516	33.022	38.074	2.446	<b>30.065</b>	<b>34.579</b>	<b>1.999</b>	253.865	279.859	86.945	102.660	115.618	24.825
3	1	42.521	46.722	<b>3.001</b>	45.216	49.434	3.092	46.650	50.889	3.263	95.600	99.752	13.224	<b>39.934</b>	<b>44.600</b>	3.118
	2	45.602	49.747	3.364	44.979	49.090	2.994	47.879	52.235	3.343	134.146	140.442	25.743	<b>42.425</b>	<b>46.346</b>	<b>2.924</b>
	3	38.562	41.770	2.495	<b>36.453</b>	<b>39.685</b>	<b>2.225</b>	39.589	42.897	2.514	96.300	101.191	14.511	45.385	49.612	3.348
	4	46.931	50.805	3.578	<b>44.474</b>	<b>48.186</b>	<b>3.003</b>	45.042	48.974	3.093	148.741	155.952	30.832	49.627	53.543	3.878
	5	<b>44.501</b>	<b>48.326</b>	3.149	47.600	51.429	3.241	48.548	52.586	3.547	208.560	218.464	65.671	45.840	49.336	<b>3.011</b>
	6	46.895	51.359	3.550	<b>38.599</b>	<b>43.109</b>	<b>2.835</b>	43.611	47.944	2.969	277.870	300.634	155.495	52.319	58.812	5.451
	7	44.114	47.301	3.039	<b>39.212</b>	<b>43.367</b>	2.820	40.199	43.742	<b>2.483</b>	221.039	233.105	88.645	60.747	64.147	5.246
	8	<b>34.164</b>	<b>37.806</b>	<b>2.438</b>	40.516	44.073	2.549	40.217	43.699	2.517	244.700	258.491	79.233	42.267	46.060	3.151
4	1	37.728	41.690	2.469	36.577	40.530	<b>2.418</b>	<b>36.138</b>	<b>40.171</b>	2.429	96.399	103.216	14.724	48.394	52.123	3.172
	2	37.439	40.642	2.326	34.957	38.093	<b>2.149</b>	<b>34.896</b>	<b>37.990</b>	2.150	168.909	178.702	39.540	36.608	39.949	2.330
	3	40.867	44.524	2.630	<b>40.481</b>	<b>44.064</b>	<b>2.609</b>	41.128	45.063	3.545	157.463	165.249	32.141	42.352	46.352	2.894
	4	42.467	46.101	2.926	<b>37.028</b>	<b>40.481</b>	<b>2.440</b>	37.690	41.078	2.456	134.431	144.386	28.958	37.683	41.682	2.801
	5	38.691	42.557	2.521	35.799	39.361	2.189	<b>34.541</b>	<b>38.072</b>	<b>2.102</b>	163.817	174.944	38.276	38.140	42.087	2.517
	6	32.911	35.737	1.928	<b>32.250</b>	<b>35.043</b>	<b>1.834</b>	33.816	36.512	1.903	534.531	570.847	387.308	33.419	35.723	1.861
	7	36.027	39.722	2.229	<b>34.725</b>	<b>37.958</b>	1.893	35.288	38.657	1.933	130.938	139.670	25.962	35.448	38.620	<b>1.862</b>
	8	39.191	43.182	2.605	<b>35.805</b>	<b>39.400</b>	2.211	36.251	39.670	<b>2.191</b>	143.063	152.151	40.169	39.097	42.676	2.515
5	1	29.531	31.884	1.156	33.926	37.629	1.735	33.570	37.306	1.736	17.509	19.121	0.505	<b>14.267</b>	<b>15.774</b>	<b>0.416</b>
	2	26.955	28.899	1.148	32.476	35.875	1.735	32.561	35.921	1.714	20.975	23.057	0.679	<b>9.618</b>	<b>10.449</b>	<b>0.180</b>
	3	28.834	31.399	1.229	37.252	41.680	2.208	37.059	41.495	2.204	25.181	28.132	1.017	<b>10.501</b>	<b>11.685</b>	<b>0.234</b>
	4	32.880	35.322	1.397	37.871	42.307	2.349	38.869	43.229	2.356	17.963	19.619	0.597	<b>10.291</b>	<b>11.373</b>	<b>0.254</b>
	5	21.239	22.985	0.795	37.730	42.572	2.381	37.900	42.707	2.356	18.145	20.341	0.601	<b>13.271</b>	<b>14.721</b>	<b>0.286</b>
	6	18.878	21.094	0.905	36.277	40.490	2.076	36.300	40.519	2.081	17.853	19.534	0.569	<b>11.632</b>	<b>12.918</b>	<b>0.310</b>
	7	18.146	19.623	0.718	33.827	37.592	1.851	33.651	37.418	1.842	22.331	24.150	0.768	<b>14.268</b>	<b>15.887</b>	<b>0.428</b>
	8	21.852	24.152	0.941	40.645	46.248	2.873	39.733	45.441	2.899	24.709	27.179	0.933	<b>9.815</b>	<b>11.091</b>	<b>0.260</b>
6	1	<b>18.313</b>	<b>19.730</b>	<b>0.524</b>	31.899	35.028	1.893	37.037	40.470	2.263	31.738	34.415	1.437	18.482	19.910	0.551
	2	<b>18.285</b>	<b>19.705</b>	<b>0.545</b>	27.381	29.733	1.322	31.116	33.802	1.670	24.302	26.192	0.929	18.471	20.019	0.595
	3	12.109	13.410	<b>0.339</b>	24.689	27.422	1.397	30.700	33.753	1.820	23.593	25.975	1.090	<b>11.445</b>	<b>12.750</b>	0.373
	4	<b>11.878</b>	<b>13.176</b>	<b>0.347</b>	26.236	28.956	1.454	33.650	36.913	1.993	24.742	27.425	1.287	13.650	15.189	0.498
	5	25.126	27.875	1.028	27.795	31.390	1.488	36.061	40.371	2.061	<b>23.843</b>	<b>26.763</b>	0.981	24.526	27.177	<b>0.935</b>
	6	<b>18.877</b>	<b>20.099</b>	<b>0.511</b>	34.327	37.308	1.923	39.855	43.080	2.428	32.613	35.190	1.533	23.902	25.364	0.840
	7	<b>11.691</b>	<b>12.899</b>	<b>0.357</b>	21.943	24.168	1.062	28.555	31.103	1.455	20.143	22.206	0.913	15.593	17.249	0.631
	8	13.831	15.064	<b>0.354</b>	23.223	25.407	1.114	28.561	31.023	1.427	21.633	23.743	1.090	<b>13.426</b>	<b>14.744</b>	0.413

**Note:** (1). All values are the average value of 3 experiments; (2). For intuitive display, all values have been magnified 1000 times.

Table C.18: The results of XJTU battery dataset, the input type is handcraft features with z-score normalization.

The best result was **bolded**.

Model		CNN			LSTM			GRU			MLP			Attention		
Batch	Battery	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
1	1	4.884	5.249	<b>0.038</b>	7.252	7.682	0.151	7.987	8.548	0.149	41.011	44.778	2.474	<b>4.654</b>	<b>4.980</b>	0.050
	2	<b>4.065</b>	<b>4.557</b>	<b>0.033</b>	6.261	6.887	0.096	6.830	7.519	0.123	35.714	38.178	2.008	5.479	6.048	0.065
	3	<b>6.947</b>	<b>7.590</b>	<b>0.075</b>	12.628	13.753	0.259	11.811	13.027	0.264	42.351	45.553	3.259	9.338	10.387	0.155
	4	5.208	5.675	<b>0.047</b>	<b>5.047</b>	<b>5.476</b>	0.055	6.384	6.965	0.107	33.290	35.673	1.590	6.754	7.293	0.084
	5	<b>4.121</b>	<b>4.527</b>	<b>0.028</b>	5.398	5.867	0.060	6.212	6.812	0.093	27.599	30.138	1.296	5.670	6.137	0.056
	6	<b>4.789</b>	<b>5.153</b>	<b>0.036</b>	5.791	6.238	0.088	6.492	7.038	0.090	36.564	39.537	2.547	6.299	6.814	0.085
	7	<b>5.685</b>	<b>6.132</b>	<b>0.053</b>	8.080	8.804	0.136	8.086	8.814	0.154	38.174	41.406	2.273	10.207	10.844	0.280
	8	<b>6.296</b>	<b>6.975</b>	<b>0.071</b>	15.895	17.526	0.548	17.349	19.110	0.702	85.827	92.088	10.632	9.224	10.208	0.155
2	1	<b>4.688</b>	<b>5.071</b>	<b>0.037</b>	5.665	6.096	0.052	9.453	10.199	0.225	15.691	16.666	0.375	10.219	10.887	0.183
	2	<b>8.765</b>	<b>9.146</b>	<b>0.099</b>	11.713	12.271	0.273	15.960	16.880	0.799	33.392	35.628	1.798	11.524	12.082	0.201
	3	20.263	21.802	0.686	<b>19.812</b>	<b>21.517</b>	<b>0.632</b>	23.538	24.959	1.246	21.267	22.483	0.729	21.348	23.067	0.915
	4	<b>7.315</b>	<b>8.015</b>	<b>0.081</b>	10.671	11.627	0.155	14.793	16.167	0.353	19.504	20.832	0.615	10.644	11.693	0.171
	5	10.913	11.737	0.263	<b>7.135</b>	<b>7.606</b>	<b>0.084</b>	14.118	15.076	0.463	13.253	14.488	0.317	10.719	11.522	0.203
	6	<b>5.154</b>	<b>5.567</b>	<b>0.047</b>	7.201	7.774	0.086	10.869	11.649	0.211	24.287	26.170	0.913	11.323	12.210	0.224
	7	<b>6.931</b>	<b>7.416</b>	<b>0.074</b>	8.863	9.392	0.114	11.154	11.897	0.204	22.319	23.610	0.728	9.150	9.756	0.127
	8	<b>8.613</b>	<b>9.256</b>	<b>0.122</b>	10.926	11.719	0.171	16.834	17.942	0.515	22.612	23.880	0.788	12.170	12.924	0.238

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Model		CNN			LSTM			GRU			MLP			Attention		
Batch	Battery	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
	9	15.089	16.452	0.320	16.021	17.223	0.416	21.145	22.953	1.148	49.523	53.483	3.591	<b>12.507</b>	<b>13.702</b>	<b>0.249</b>
	10	<b>7.463</b>	<b>8.021</b>	<b>0.079</b>	7.784	8.654	0.116	14.389	16.081	0.480	16.185	17.416	0.432	10.500	11.523	0.176
	11	<b>4.712</b>	<b>5.125</b>	<b>0.036</b>	6.941	7.587	0.079	13.039	14.311	0.292	16.711	18.079	0.453	7.857	8.632	0.102
	12	<b>7.500</b>	<b>8.303</b>	<b>0.093</b>	10.197	11.184	0.157	15.247	16.509	0.385	8.432	9.104	0.107	11.082	12.191	0.190
	13	<b>9.559</b>	<b>10.656</b>	<b>0.158</b>	11.932	13.360	0.273	14.255	15.710	0.344	37.298	41.252	2.716	11.337	12.585	0.239
	14	<b>4.907</b>	<b>5.369</b>	<b>0.035</b>	7.104	7.732	0.074	12.804	14.106	0.258	7.385	8.030	0.094	8.177	8.940	0.108
	15	<b>8.712</b>	<b>9.567</b>	<b>0.101</b>	11.058	12.058	0.158	14.928	16.488	0.344	15.634	17.079	0.372	9.369	10.274	0.142
3	1	<b>8.092</b>	<b>8.887</b>	<b>0.122</b>	11.056	12.145	0.215	16.941	18.549	0.521	42.411	46.061	2.642	9.627	10.649	0.192
	2	<b>4.940</b>	<b>5.403</b>	<b>0.046</b>	5.937	6.459	0.064	10.543	11.527	0.244	29.105	30.764	1.392	6.044	6.569	0.069
	3	<b>5.789</b>	<b>6.210</b>	<b>0.052</b>	10.248	11.114	0.306	14.029	15.154	1.030	29.325	31.370	1.490	8.424	9.112	0.144
	4	<b>4.119</b>	<b>4.359</b>	<b>0.028</b>	6.125	6.420	0.062	10.463	11.230	0.234	19.165	20.115	0.594	5.354	5.762	0.057
	5	<b>5.182</b>	<b>5.765</b>	0.060	5.683	6.189	<b>0.056</b>	8.545	9.332	0.189	21.121	22.375	0.604	6.855	7.455	0.091
	6	<b>4.016</b>	<b>4.342</b>	<b>0.026</b>	4.509	4.803	0.032	9.270	10.055	0.180	14.275	15.195	0.336	6.576	7.100	0.082
	7	<b>5.416</b>	<b>5.857</b>	<b>0.055</b>	6.302	6.775	0.061	11.265	12.112	0.262	17.901	18.840	0.545	9.870	10.565	0.196
	8	<b>3.263</b>	<b>3.534</b>	<b>0.020</b>	5.547	5.993	0.069	8.584	9.257	0.202	34.791	36.743	1.771	6.502	6.972	0.076
4	1	<b>7.858</b>	<b>8.694</b>	<b>0.108</b>	8.316	9.145	0.112	17.028	18.590	0.510	14.898	16.045	0.378	9.684	10.657	0.168
	2	6.395	6.915	<b>0.065</b>	<b>6.239</b>	<b>6.802</b>	0.069	9.717	10.538	0.202	10.676	11.414	0.204	8.090	8.736	0.102
	3	<b>5.690</b>	<b>6.081</b>	<b>0.052</b>	6.398	6.830	0.055	11.042	11.945	0.303	14.713	15.716	0.360	6.559	7.170	0.078
	4	<b>6.019</b>	<b>6.509</b>	<b>0.055</b>	7.931	8.506	0.081	12.349	13.294	0.364	20.546	22.001	0.607	7.587	8.289	0.100
	5	5.929	6.427	0.050	<b>5.671</b>	<b>6.141</b>	<b>0.045</b>	10.692	11.600	0.220	9.940	10.697	0.186	7.518	8.134	0.080
	6	<b>4.343</b>	<b>4.725</b>	<b>0.038</b>	4.631	5.067	0.044	9.498	10.279	0.323	7.151	7.646	0.085	5.444	5.886	0.055
	7	<b>6.022</b>	<b>6.513</b>	0.054	6.095	6.564	<b>0.054</b>	12.467	13.643	0.370	20.916	22.718	1.105	7.300	7.966	0.100
	8	5.356	5.969	0.062	<b>5.324</b>	<b>5.873</b>	<b>0.057</b>	10.051	10.955	0.264	8.035	8.684	0.111	7.888	8.566	0.115
5	1	19.147	20.857	1.060	18.092	19.847	1.012	<b>16.819</b>	<b>18.537</b>	0.837	46.230	50.403	3.499	18.258	19.993	<b>0.716</b>
	2	13.336	14.599	0.344	<b>11.471</b>	<b>12.650</b>	<b>0.267</b>	16.965	18.737	0.556	57.580	62.466	4.638	14.667	15.875	0.364
	3	14.047	15.637	0.386	15.318	17.239	0.549	17.231	19.375	0.667	60.556	68.654	7.425	<b>13.892</b>	<b>15.415</b>	<b>0.354</b>
	4	16.315	17.736	0.473	13.626	14.896	0.350	20.363	22.287	0.798	69.432	74.818	5.761	<b>13.353</b>	<b>14.694</b>	<b>0.334</b>
	5	15.931	17.716	0.601	<b>12.912</b>	<b>14.416</b>	<b>0.336</b>	14.405	15.997	0.411	31.252	34.426	1.630	13.670	15.243	0.347
	6	<b>9.659</b>	<b>10.676</b>	<b>0.202</b>	10.220	11.367	0.227	13.491	15.010	0.460	31.316	34.803	1.762	12.928	14.283	0.321
	7	11.354	12.428	<b>0.253</b>	<b>11.342</b>	<b>12.410</b>	0.266	16.684	18.290	0.584	41.917	45.790	2.826	13.733	14.993	0.414
	8	<b>12.966</b>	<b>14.767</b>	0.374	14.116	15.995	0.429	15.373	17.233	0.487	52.883	57.570	3.795	13.527	15.088	<b>0.341</b>
6	1	<b>8.644</b>	<b>9.277</b>	<b>0.126</b>	11.191	12.100	0.226	11.536	12.454	0.237	14.131	15.079	0.292	9.827	10.611	0.169
	2	10.679	11.422	0.205	9.605	10.334	<b>0.197</b>	<b>9.498</b>	<b>10.246</b>	0.209	13.354	14.290	0.321	12.272	13.128	0.268
	3	<b>6.972</b>	<b>7.597</b>	<b>0.095</b>	8.283	9.025	0.137	8.953	9.733	0.156	10.364	11.193	0.197	8.142	8.834	0.125
	4	<b>6.855</b>	<b>7.478</b>	<b>0.091</b>	8.645	9.465	0.156	10.395	11.351	0.215	10.146	11.150	0.220	7.819	8.564	0.127
	5	23.218	25.395	<b>0.670</b>	24.001	26.236	0.742	24.871	27.207	0.843	24.240	26.357	0.846	<b>22.897</b>	<b>25.049</b>	0.701
	6	14.162	15.038	0.263	21.769	22.898	0.604	22.829	23.984	0.663	37.426	38.915	1.795	<b>13.368</b>	<b>14.178</b>	<b>0.255</b>
	7	<b>7.113</b>	<b>7.682</b>	<b>0.092</b>	9.437	10.241	0.183	9.307	10.078	0.171	9.486	10.270	0.173	8.124	8.783	0.121
	8	<b>7.260</b>	<b>7.835</b>	<b>0.107</b>	10.399	11.138	0.344	12.000	12.814	0.448	9.178	9.906	0.168	8.201	8.816	0.120

**Note:** (1). All values are the average value of 3 experiments; (2). For intuitive display, all values have been magnified 1000 times.

Table C.19: The results of XJTU battery dataset with [-1,1] normalization. For each **column**, within each batch, the best result of three input types was **bolded**. For each **row**, the best result among five models was shown in *italics*.

Model		CNN			LSTM			GRU			MLP			Attention		
Input type	Batch	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
A	1	12.362	13.421	0.300	20.080	22.542	0.788	21.891	24.456	0.853	<i>7.398</i>	<i>8.121</i>	<i>0.098</i>	9.818	10.784	0.165
	2	18.012	19.338	0.780	21.697	23.795	0.789	23.102	25.323	0.845	<i>11.910</i>	<i>12.910</i>	<i>0.257</i>	12.489	13.574	0.282
	3	7.815	8.474	0.108	26.675	29.405	1.337	28.004	30.621	1.278	<i>7.261</i>	<i>7.907</i>	<i>0.096</i>	8.100	8.742	0.107
	4	<i>8.494</i>	<i>9.240</i>	<i>0.127</i>	23.775	26.404	1.142	25.403	28.080	1.189	9.585	10.437	0.166	9.893	10.742	0.173
	5	14.928	16.230	0.431	36.014	40.298	2.133	36.115	40.443	2.165	<b>12.363</b>	<b>13.578</b>	<b>0.271</b>	12.741	13.990	0.288
	6	<i>18.795</i>	<i>20.374</i>	<i>0.723</i>	28.440	31.280	1.512	28.078	30.915	1.503	23.320	25.331	1.157	21.913	23.822	1.030
B	1	<i>6.235</i>	<i>6.822</i>	0.070	7.480	8.169	0.083	7.834	8.487	0.088	6.408	6.960	<i>0.062</i>	7.803	8.449	0.095
	2	<b>10.766</b>	<b>11.590</b>	<b>0.251</b>	10.711	11.692	0.191	10.715	11.626	0.189	<b>6.186</b>	<b>6.675</b>	<b>0.067</b>	10.791	11.806	0.205
	3	6.509	6.898	0.072	6.343	6.766	0.063	6.290	6.683	0.060	<i>5.562</i>	<i>5.930</i>	<i>0.053</i>	8.705	9.262	0.136
	4	<i>7.981</i>	<i>8.695</i>	0.122	10.894	11.863	0.191	11.012	11.949	0.184	8.098	8.783	<i>0.108</i>	9.712	10.500	0.158
	5	16.668	18.079	0.487	35.771	40.082	2.138	36.165	40.443	2.133	16.901	18.571	0.497	<i>14.103</i>	<i>15.475</i>	<i>0.325</i>
	6	<i>16.882</i>	<i>18.370</i>	<i>0.543</i>	33.128	36.262	1.890	33.045	36.218	1.900	24.581	26.849	1.054	20.517	22.356	0.759
C	1	<b>5.816</b>	<b>6.311</b>	<b>0.060</b>	<b>4.581</b>	<b>5.039</b>	<b>0.039</b>	<i>3.862</i>	<i>4.223</i>	<i>0.028</i>	<b>4.254</b>	<b>4.612</b>	<b>0.034</b>	<b>6.606</b>	<b>7.238</b>	<b>0.078</b>
	2	11.466	12.293	0.294	<b>9.337</b>	<b>10.105</b>	<b>0.135</b>	<b>8.149</b>	<b>8.791</b>	<b>0.109</b>	<i>7.538</i>	<i>8.092</i>	<i>0.104</i>	<b>10.474</b>	<b>11.414</b>	<b>0.171</b>
	3	<b>4.783</b>	<b>5.081</b>	<b>0.042</b>	<b>4.726</b>	<b>5.056</b>	<b>0.039</b>	<b>3.938</b>	<b>4.194</b>	<b>0.026</b>	<i>3.831</i>	<i>4.074</i>	<i>0.024</i>	<b>5.914</b>	<b>6.332</b>	<b>0.058</b>
	4	<b>5.350</b>	<b>5.781</b>	<b>0.045</b>	<b>5.954</b>	<b>6.456</b>	<b>0.057</b>	<b>5.399</b>	<b>5.831</b>	<b>0.045</b>	<i>4.945</i>	<i>5.324</i>	<i>0.038</i>	<b>6.264</b>	<b>6.754</b>	<b>0.065</b>
	5	<b>11.553</b>	<b>12.643</b>	<b>0.237</b>	<b>9.641</b>	<b>10.663</b>	<b>0.172</b>	<i>9.409</i>	<i>10.382</i>	<i>0.154</i>	15.289	16.641	0.451	<b>10.225</b>	<b>11.244</b>	<b>0.180</b>
	6	<i>10.048</i>	<i>10.841</i>	<i>0.171</i>	<b>11.992</b>	<b>13.065</b>	<b>0.248</b>	<b>11.260</b>	<b>12.241</b>	<b>0.218</b>	<b>11.237</b>	<b>12.196</b>	<b>0.214</b>	<b>11.403</b>	<b>12.357</b>	<b>0.227</b>

\* A is the charging data; B is the partial charging data; C is the handcraft features

**Note:** (1). All values are the average value of 3 experiments; (2). For intuitive display, all values have been magnified 1000 times.

Table C.20: The results of XJTU battery dataset with [0,1] normalization. For each **column**, within each batch, the best result of three input types was **bolded**. For each **row**, the best result among five models was shown in *italics*.

Model		CNN			LSTM			GRU			MLP			Attention		
Input type	Batch	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
A	1	10.431	11.438	0.198	22.463	25.174	0.934	23.863	26.676	1.007	<i>8.134</i>	<i>8.964</i>	<i>0.121</i>	8.779	9.594	0.133
	2	16.782	18.137	0.743	25.637	28.138	0.975	24.853	27.307	0.945	13.246	14.352	0.293	<i>12.640</i>	<i>13.747</i>	<i>0.268</i>
	3	9.786	10.548	0.187	27.089	29.875	1.360	28.528	31.516	1.502	<i>7.696</i>	<i>8.427</i>	<i>0.112</i>	7.950	8.675	0.118
	4	<b>7.560</b>	<b>8.233</b>	<b>0.103</b>	25.121	27.875	1.216	25.150	27.902	1.221	10.124	11.042	0.201	10.083	10.988	0.191
	5	16.127	17.388	0.466	35.953	40.263	2.142	36.056	40.359	2.143	<i>14.737</i>	<i>16.164</i>	<i>0.381</i>	17.148	18.802	0.487
	6	<i>17.672</i>	<i>19.194</i>	<i>0.679</i>	28.433	31.287	1.514	27.831	30.671	1.497	22.340	24.312	1.001	20.747	22.587	0.919
B	1	<i>5.703</i>	<i>6.288</i>	<i>0.058</i>	8.852	9.758	0.130	8.371	9.200	0.114	8.549	9.274	0.108	12.275	13.539	0.265
	2	<b>13.238</b>	<b>14.201</b>	<b>0.463</b>	11.769	12.921	0.238	11.250	12.310	0.211	<i>9.635</i>	<i>10.503</i>	<i>0.154</i>	11.752	12.858	0.242
	3	<i>5.710</i>	<i>6.099</i>	<i>0.056</i>	7.192	7.723	0.082	6.932	7.449	0.077	6.858	7.305	0.075	8.436	9.066	0.130
	4	<i>8.087</i>	<i>8.810</i>	<i>0.118</i>	11.593	12.682	0.225	11.541	12.583	0.213	9.923	10.759	0.151	10.770	11.688	0.196
	5	<b>15.704</b>	<b>17.161</b>	<b>0.432</b>	35.621	39.928	2.141	35.905	40.214	2.139	<i>14.824</i>	<i>16.268</i>	<i>0.356</i>	17.433	19.204	0.520
	6	<i>17.409</i>	<i>18.972</i>	<i>0.567</i>	33.432	36.537	1.905	32.969	36.111	1.889	27.453	30.101	1.330	29.126	31.901	1.521
C	1	27.359	29.201	1.459	<b>5.210</b>	<b>5.762</b>	<b>0.051</b>	<i>4.299</i>	<i>4.693</i>	<i>0.032</i>	<b>6.754</b>	<b>7.284</b>	<b>0.082</b>	<b>6.767</b>	<b>7.338</b>	<b>0.069</b>
	2	28.032	30.128	1.581	<b>10.023</b>	<b>10.862</b>	<b>0.156</b>	<i>8.777</i>	<i>9.488</i>	<i>0.120</i>	<b>9.040</b>	<b>9.743</b>	<b>0.142</b>	<b>10.148</b>	<b>11.005</b>	<b>0.163</b>
	3	10.320	10.928	0.418	<b>5.406</b>	<b>5.802</b>	<b>0.052</b>	<i>4.371</i>	<i>4.656</i>	<i>0.033</i>	<b>4.486</b>	<b>4.765</b>	<b>0.034</b>	<b>5.689</b>	<b>6.050</b>	<b>0.054</b>
	4	8.160	8.739	0.162	<b>6.546</b>	<b>7.122</b>	<b>0.073</b>	<b>5.777</b>	<b>6.235</b>	<b>0.053</b>	<i>5.492</i>	<i>5.913</i>	<i>0.048</i>	<b>6.015</b>	<b>6.499</b>	<b>0.059</b>
	5	34.582	37.306	1.752	<b>9.911</b>	<b>10.987</b>	<b>0.189</b>	<i>9.873</i>	<i>10.899</i>	<i>0.173</i>	<b>13.836</b>	<b>15.129</b>	<b>0.317</b>	<b>9.940</b>	<b>11.020</b>	<b>0.201</b>
	6	<i>9.702</i>	<i>10.485</i>	<i>0.176</i>	<b>17.241</b>	<b>18.768</b>	<b>0.663</b>	<b>11.182</b>	<b>12.195</b>	<b>0.225</b>	<b>10.830</b>	<b>11.801</b>	<b>0.210</b>	<b>10.239</b>	<b>11.126</b>	<b>0.192</b>

\* A is the charging data; B is the partial charging data; C is the handcraft features

**Note:** (1). All values are the average value of 3 experiments; (2). For intuitive display, all values have been magnified 1000 times.

Table C.21: The results of XJTU battery dataset with z-score normalization. For each **column**, within each batch, the best result of three input types was **bolded**. For each **row**, the best result among five models was shown in *italics*.

Model		CNN			LSTM			GRU			MLP			Attention		
Input type	Batch	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
A	1	21.797	23.585	0.877	20.702	23.178	0.820	23.798	26.636	1.025	<b>8.187</b>	<b>8.840</b>	<b>0.102</b>	<i>6.715</i>	<i>7.358</i>	<i>0.093</i>
	2	20.930	22.461	1.115	26.535	29.126	1.142	31.294	34.319	1.512	<b>17.556</b>	<b>18.912</b>	<b>0.463</b>	<i>12.179</i>	<i>13.219</i>	<i>0.322</i>
	3	7.229	7.710	0.146	27.446	30.440	1.510	31.143	34.483	1.811	<b>11.234</b>	<b>12.050</b>	<b>0.207</b>	<i>6.619</i>	<i>7.162</i>	<i>0.081</i>
	4	<i>7.816</i>	<i>8.420</i>	<i>0.116</i>	24.120	26.791	1.185	25.632	28.433	1.275	<b>8.683</b>	<b>9.391</b>	<b>0.128</b>	8.012	8.750	0.121
	5	22.799	24.774	0.847	36.042	40.334	2.135	35.762	40.078	2.139	<b>13.419</b>	<b>14.764</b>	<b>0.329</b>	<i>11.714</i>	<i>12.903</i>	<i>0.279</i>
	6	<i>12.776</i>	<i>13.803</i>	<i>0.308</i>	28.277	31.121	1.494	29.232	32.103	1.554	18.522	20.192	0.705	16.304	17.629	0.515
B	1	<i>36.364</i>	<i>40.309</i>	2.474	37.388	41.412	<i>2.438</i>	44.055	48.648	2.776	287.701	311.225	143.892	43.185	47.013	3.072
	2	41.711	45.850	2.975	35.607	39.325	<i>2.153</i>	<i>35.514</i>	<i>39.264</i>	2.303	278.173	301.800	186.625	55.613	60.714	5.971
	3	42.911	46.730	3.077	<i>42.131</i>	<i>46.047</i>	<i>2.845</i>	43.967	47.871	2.966	178.370	188.504	59.169	47.318	51.557	3.766
	4	38.165	41.769	2.454	<i>35.953</i>	<i>39.366</i>	<i>2.218</i>	36.219	39.652	2.339	191.194	203.646	75.885	38.893	42.401	2.494
	5	24.789	26.920	1.036	36.250	40.549	2.151	36.205	40.504	2.148	20.583	22.642	0.709	<b>11.708</b>	<i>12.987</i>	<i>0.296</i>
	6	<i>16.264</i>	<i>17.745</i>	<i>0.501</i>	27.187	29.926	1.457	33.192	36.314	1.890	25.326	27.738	1.157	17.437	19.050	0.605
C	1	<i>5.249</i>	<i>5.732</i>	<i>0.047</i>	<b>8.294</b>	<b>9.029</b>	<b>0.174</b>	<b>8.894</b>	<b>9.729</b>	<b>0.210</b>	42.566	45.919	3.260	7.203	7.839	0.116
	2	<i>8.706</i>	<i>9.434</i>	<i>0.149</i>	<b>10.202</b>	<b>11.053</b>	<b>0.189</b>	<b>14.835</b>	<b>16.062</b>	<b>0.484</b>	21.566	23.213	0.935	<b>11.195</b>	<b>12.133</b>	<b>0.231</b>
	3	<i>5.102</i>	<i>5.545</i>	<i>0.051</i>	<b>6.926</b>	<b>7.487</b>	<b>0.108</b>	<b>11.205</b>	<b>12.152</b>	<b>0.358</b>	26.012	27.683	1.172	7.406	8.023	0.113
	4	<i>5.951</i>	<i>6.479</i>	<i>0.060</i>	<b>6.326</b>	<b>6.866</b>	<b>0.065</b>	<b>11.605</b>	<b>12.605</b>	<b>0.320</b>	13.359	14.365	0.380	<b>7.509</b>	<b>8.175</b>	<b>0.100</b>
	5	<b>14.095</b>	<b>15.552</b>	<b>0.462</b>	<i>13.387</i>	<i>14.853</i>	<b>0.429</b>	<b>16.416</b>	<b>18.183</b>	<b>0.600</b>	48.896	53.616	3.917	14.254	15.698	<i>0.399</i>
	6	<i>10.613</i>	<i>11.466</i>	<i>0.206</i>	<b>12.916</b>	<b>13.930</b>	<b>0.324</b>	<b>13.673</b>	<b>14.733</b>	<b>0.368</b>	<b>16.041</b>	<b>17.145</b>	<b>0.501</b>	<b>11.331</b>	<b>12.245</b>	<b>0.236</b>

\* A is the charging data; B is the partial charging data; C is the handcraft features

**Note:** (1). All values are the average value of 3 experiments; (2). For intuitive display, all values have been magnified 1000 times.

Table C.22: The results of Toyota-MIT-Stanford dataset with [-1,1] normalization. For each **column**, within each batch, the best result of three input types was **bolded**. For each **row**, the best result among five models was shown in *italics*.

Model		CNN			LSTM			GRU			MLP			Attention		
Input type	Group	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
A	1	17.439	18.865	0.825	12.057	13.446	0.352	12.167	13.515	0.335	11.349	12.572	0.259	<i>8.666</i>	<i>9.659</i>	<i>0.197</i>
	2	28.806	30.787	1.466	21.895	23.840	0.768	22.216	24.125	0.754	15.505	16.823	0.458	<i>11.476</i>	<i>12.511</i>	<i>0.263</i>
	3	12.529	13.549	0.513	<i>9.524</i>	<i>10.579</i>	0.210	<b>9.567</b>	<b>10.597</b>	<i>0.200</i>	14.133	15.538	0.434	11.331	12.521	0.294
	4	<b>8.893</b>	<b>9.546</b>	<b>0.189</b>	<b>8.523</b>	<b>9.414</b>	0.181	8.746	9.626	0.177	6.980	7.724	0.138	<i>6.213</i>	<i>6.855</i>	<i>0.095</i>
	5	46.447	49.840	4.016	34.483	37.625	2.410	42.620	46.191	3.933	22.823	24.710	0.888	<i>17.656</i>	<i>19.138</i>	<i>0.607</i>
	6	9.772	10.572	0.341	8.657	9.464	0.173	9.006	9.786	0.166	9.530	10.375	0.198	<i>7.543</i>	<i>8.244</i>	<i>0.139</i>
	7	<i>8.538</i>	<i>9.251</i>	<i>0.101</i>	12.321	13.518	0.257	12.225	13.359	0.246	13.884	15.186	0.344	10.484	11.470	0.190
	8	14.233	15.220	0.574	12.979	14.242	0.292	12.255	13.439	0.265	14.525	15.820	0.374	<i>11.952</i>	<i>13.028</i>	<i>0.258</i>
	9	18.984	20.433	0.916	12.362	13.663	0.352	11.764	12.966	0.308	9.917	11.014	0.291	<i>9.424</i>	<i>10.450</i>	<i>0.262</i>
B	1	10.728	11.597	0.287	10.223	10.996	0.160	10.381	11.236	0.172	<b>5.364</b>	<b>5.822</b>	0.067	<i>5.078</i>	<i>5.524</i>	<i>0.055</i>
	2	52.206	55.765	3.553	12.513	13.592	0.288	12.905	14.022	0.307	10.989	11.871	0.257	<i>9.578</i>	<i>10.411</i>	<i>0.182</i>
	3	28.259	30.263	1.585	10.527	11.494	0.221	12.285	13.433	0.277	<i>7.773</i>	<i>8.489</i>	<i>0.133</i>	8.896	9.649	<b>0.140</b>
	4	16.096	17.217	0.594	8.879	9.707	<b>0.145</b>	<b>8.488</b>	<b>9.357</b>	<b>0.158</b>	<i>5.931</i>	<i>6.527</i>	<i>0.073</i>	6.553	7.214	0.105
	5	17.604	19.028	0.699	<b>6.905</b>	<b>7.684</b>	0.135	<b>6.758</b>	<b>7.607</b>	0.154	<i>5.300</i>	<i>5.865</i>	<i>0.062</i>	<b>5.957</b>	<b>6.505</b>	<b>0.078</b>
	6	32.939	35.311	1.969	7.358	8.050	0.110	<b>6.394</b>	7.028	0.096	<b>5.938</b>	<b>6.462</b>	0.099	<i>5.360</i>	<i>5.870</i>	<i>0.066</i>
	7	47.674	50.832	3.848	23.928	25.932	1.080	33.101	35.670	2.545	<i>10.357</i>	<i>11.162</i>	<b>0.271</b>	10.649	11.458	<i>0.218</i>
	8	<b>8.332</b>	<b>9.076</b>	<b>0.158</b>	<b>8.757</b>	<b>9.561</b>	<b>0.124</b>	<b>8.409</b>	<b>9.207</b>	<b>0.130</b>	<i>4.370</i>	<i>4.859</i>	<i>0.063</i>	<b>9.330</b>	<b>10.161</b>	<b>0.143</b>
	9	20.065	21.618	0.809	<b>6.910</b>	<b>7.602</b>	0.110	<b>7.198</b>	<b>7.950</b>	0.126	<i>6.756</i>	<i>7.382</i>	<b>0.125</b>	7.024	7.668	<i>0.090</i>
C	1	<i>5.748</i>	<i>6.228</i>	<i>0.056</i>	<b>6.664</b>	<b>7.213</b>	<b>0.066</b>	<b>6.109</b>	<b>6.584</b>	<i>0.056</i>	6.842	7.355	<b>0.066</b>	7.314	7.958	0.086
	2	<b>6.857</b>	<b>7.338</b>	<b>0.082</b>	<b>7.980</b>	<b>8.567</b>	<b>0.098</b>	<b>7.426</b>	<b>7.972</b>	<b>0.079</b>	<i>6.574</i>	<i>7.080</i>	<i>0.067</i>	<b>8.525</b>	<b>9.168</b>	<b>0.123</b>
	3	<b>9.859</b>	<b>10.562</b>	<i>0.139</i>	10.375	11.181	<b>0.155</b>	10.874	11.701	<b>0.164</b>	14.111	15.116	0.260	<i>8.879</i>	<i>9.616</i>	0.143
	4	19.982	21.262	0.648	13.130	14.070	0.237	13.267	14.176	<i>0.208</i>	26.294	27.892	1.289	<i>12.515</i>	<i>13.430</i>	0.227
	5	<b>8.298</b>	<b>8.966</b>	<b>0.129</b>	8.777	9.439	<b>0.110</b>	<i>7.572</i>	<i>8.124</i>	<i>0.081</i>	9.739	10.416	0.134	10.461	11.295	0.161
	6	<b>8.709</b>	<b>9.276</b>	<b>0.105</b>	<b>7.019</b>	<b>7.479</b>	<b>0.080</b>	<i>6.506</i>	<i>6.904</i>	<i>0.070</i>	7.027	7.464	<b>0.075</b>	7.339	7.879	0.089
	7	<b>8.150</b>	<b>8.870</b>	0.118	<b>5.496</b>	<b>5.997</b>	<b>0.056</b>	<i>5.138</i>	<i>5.595</i>	<i>0.050</i>	10.785	11.696	0.300	<b>7.925</b>	<b>8.654</b>	<b>0.099</b>
	8	12.468	13.371	0.219	12.001	12.880	0.187	12.526	13.410	0.205	11.823	12.638	0.197	<i>10.393</i>	<i>11.203</i>	<i>0.154</i>
	9	<b>9.335</b>	<b>10.018</b>	<b>0.143</b>	7.333	7.898	<b>0.079</b>	7.640	8.205	<b>0.082</b>	20.148	21.440	0.646	<i>6.583</i>	<i>7.145</i>	<i>0.070</i>

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Model		CNN			LSTM			GRU			MLP			Attention		
Input type	Group	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE

\* A is the charging data; B is the partial charging data; C is the handcraft features

**Note:** (1). All values are the average value of 3 experiments; (2). For intuitive display, all values have been magnified 1000 times.

Table C.23: The results of Toyota-MIT-Stanford dataset with [0,1] normalization. For each **column**, within each batch, the best result of three input types was **bolded**. For each **row**, the best result among five models was shown in *italics*.

Model		CNN			LSTM			GRU			MLP			Attention		
Input type	Group	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
A	1	22.775	24.579	1.249	11.601	13.057	0.376	12.482	13.911	0.359	10.385	11.597	<i>0.259</i>	<i>9.650</i>	<i>10.847</i>	0.274
	2	31.741	33.796	2.047	23.943	26.333	1.123	21.846	23.851	0.771	<i>17.176</i>	<i>18.627</i>	<i>0.470</i>	17.826	19.586	0.618
	3	<b>12.557</b>	<b>13.629</b>	<b>0.372</b>	10.460	11.637	0.256	<i>9.644</i>	<i>10.712</i>	<i>0.215</i>	<b>11.999</b>	<b>13.237</b>	<b>0.274</b>	9.882	10.996	0.229
	4	<i>6.175</i>	<i>6.691</i>	<i>0.082</i>	<b>8.880</b>	<b>9.869</b>	0.211	8.614	9.524	0.186	<b>6.982</b>	<b>7.717</b>	0.127	7.541	8.344	0.162
	5	31.019	33.359	2.241	21.047	23.284	0.939	33.437	36.408	2.037	33.563	36.204	2.254	<i>17.730</i>	<i>19.466</i>	<i>0.635</i>
	6	<b>14.363</b>	<b>15.549</b>	<b>0.570</b>	9.758	10.726	0.238	9.068	9.917	0.188	8.214	8.976	0.165	<i>6.835</i>	<i>7.576</i>	<i>0.162</i>
	7	<b>8.955</b>	<b>9.760</b>	<i>0.137</i>	12.749	14.070	0.302	12.019	13.213	0.262	<b>12.255</b>	<b>13.392</b>	<b>0.261</b>	<i>8.400</i>	<i>9.304</i>	0.165
	8	<b>16.541</b>	<b>17.768</b>	<b>0.599</b>	13.533	14.890	0.335	12.775	14.041	0.298	12.060	13.198	0.264	<i>8.756</i>	<i>9.689</i>	<i>0.195</i>
	9	17.481	18.882	0.971	14.823	16.392	0.485	12.147	13.455	0.340	<i>10.887</i>	<i>12.006</i>	<i>0.339</i>	11.577	12.862	0.346
B	1	15.891	16.899	0.754	11.117	11.956	0.190	10.732	11.551	0.161	<i>6.514</i>	<i>7.063</i>	<b>0.086</b>	<b>6.710</b>	<b>7.263</b>	<i>0.081</i>
	2	53.956	57.431	3.809	12.517	13.615	0.282	12.932	14.008	0.267	13.038	14.134	0.281	<i>11.284</i>	<i>12.264</i>	<i>0.207</i>
	3	18.314	19.708	0.766	10.591	11.582	0.237	11.049	12.048	0.210	12.307	13.361	0.313	<i>8.342</i>	<i>9.056</i>	<i>0.125</i>
	4	21.842	23.502	1.206	9.434	10.283	<b>0.157</b>	<b>8.562</b>	<b>9.368</b>	<b>0.135</b>	7.426	8.155	<b>0.121</b>	<b>6.687</b>	<b>7.317</b>	<b>0.100</b>
	5	<b>21.767</b>	<b>23.437</b>	<b>1.202</b>	<b>7.616</b>	<b>8.467</b>	0.158	<b>6.661</b>	7.438	0.119	<b>5.649</b>	<b>6.251</b>	<i>0.066</i>	<i>5.020</i>	<i>5.608</i>	<b>0.076</b>
	6	15.222	16.288	0.766	7.809	8.562	0.132	<b>6.443</b>	<b>7.048</b>	0.088	<b>5.657</b>	<b>6.184</b>	<b>0.084</b>	<i>4.676</i>	<i>5.173</i>	<i>0.065</i>
	7	37.863	40.576	2.364	23.751	25.845	0.972	35.132	37.852	2.662	35.692	38.187	2.994	<i>11.331</i>	<i>12.424</i>	<i>0.286</i>
	8	24.177	26.090	1.465	<b>9.346</b>	<b>10.217</b>	<b>0.145</b>	<b>8.672</b>	<b>9.475</b>	<b>0.121</b>	<i>5.346</i>	<i>5.914</i>	<i>0.080</i>	<b>7.017</b>	<b>7.649</b>	<b>0.093</b>
	9	<b>14.945</b>	<b>16.066</b>	<b>0.761</b>	<b>7.448</b>	<b>8.182</b>	0.123	7.086	7.788	0.107	<b>7.161</b>	<b>7.840</b>	<b>0.115</b>	<i>5.839</i>	<i>6.448</i>	<i>0.093</i>
C	1	<b>10.775</b>	<b>11.622</b>	<b>0.343</b>	<b>7.079</b>	<b>7.693</b>	<b>0.075</b>	<i>6.556</i>	<i>7.077</i>	<i>0.061</i>	9.370	10.121	0.135	6.972	7.593	0.082
	2	<b>9.439</b>	<b>10.142</b>	<b>0.197</b>	<b>8.989</b>	<b>9.681</b>	<b>0.127</b>	<b>9.142</b>	<b>9.798</b>	<b>0.125</b>	<b>11.839</b>	<b>12.686</b>	<b>0.214</b>	<i>6.717</i>	<i>7.225</i>	<i>0.081</i>
	3	19.355	20.757	0.786	<b>10.382</b>	<b>11.200</b>	<b>0.159</b>	10.574	11.379	<b>0.163</b>	16.402	17.605	0.350	<i>8.636</i>	<i>9.344</i>	<i>0.124</i>
	4	56.621	60.226	3.762	12.931	13.877	0.239	13.247	14.160	<i>0.226</i>	22.176	23.546	0.681	<i>12.273</i>	<i>13.192</i>	0.235
	5	35.065	37.486	2.108	9.128	9.843	<b>0.118</b>	<i>6.849</i>	<i>7.371</i>	<i>0.074</i>	18.213	19.545	0.448	8.306	8.962	0.103
	6	17.866	18.965	0.729	<b>7.670</b>	<b>8.206</b>	<b>0.094</b>	<i>7.065</i>	<i>7.513</i>	<i>0.075</i>	10.223	10.927	0.148	7.426	7.940	0.087
	7	23.780	25.773	1.034	<i>5.961</i>	<i>6.545</i>	<b>0.070</b>	<b>6.268</b>	<b>6.808</b>	<i>0.067</i>	14.122	15.281	0.275	<b>7.137</b>	<b>7.800</b>	<b>0.087</b>
	8	22.843	24.469	0.805	<i>11.835</i>	<i>12.743</i>	<i>0.186</i>	12.162	13.035	0.192	13.067	14.038	0.255	12.909	13.878	0.211
	9	39.385	42.106	1.928	7.619	8.231	<b>0.093</b>	<i>6.448</i>	<i>6.957</i>	<i>0.073</i>	28.892	30.912	1.252	7.404	8.006	<b>0.081</b>

\* A is the charging data; B is the partial charging data; C is the handcraft features

**Note:** (1). All values are the average value of 3 experiments; (2). For intuitive display, all values have been magnified 1000 times.

Table C.24: The results of Toyota-MIT-Stanford dataset with z-score normalization. For each **column**, within each batch, the best result of three input types was **bolded**. For each **row**, the best result among five models was shown in *italics*.

Model		CNN			LSTM			GRU			MLP			Attention		
Input type	Group	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
A	1	14.054	15.271	0.452	28.953	32.137	1.447	32.149	35.394	1.684	<i>5.415</i>	<i>5.935</i>	<i>0.072</i>	12.137	13.169	0.335
	2	26.371	28.190	1.140	24.371	26.872	1.238	23.683	26.138	1.191	<i>17.249</i>	<i>18.555</i>	<i>0.455</i>	20.198	21.751	0.688
	3	19.135	20.719	0.788	27.414	30.333	1.304	27.343	30.347	1.346	<i>7.665</i>	<i>8.409</i>	<i>0.123</i>	<b>11.078</b>	12.008	0.269
	4	15.994	17.167	0.622	19.086	20.850	0.682	29.487	32.170	1.302	<b>14.595</b>	<b>15.641</b>	<b>0.398</b>	<i>9.373</i>	<i>10.146</i>	<i>0.189</i>
	5	32.678	34.986	1.919	22.437	24.787	1.030	21.598	23.889	0.983	16.392	17.554	<i>0.412</i>	<i>14.380</i>	<i>15.613</i>	0.526
	6	18.445	19.693	0.676	25.916	28.381	1.291	25.151	27.629	1.244	<i>7.284</i>	<i>7.900</i>	<i>0.126</i>	8.868	9.535	0.158
	7	<i>10.617</i>	<i>11.462</i>	<i>0.236</i>	30.985	33.827	1.824	34.600	37.633	2.264	<b>21.274</b>	<b>22.915</b>	1.005	15.784	17.169	0.473
	8	14.474	15.645	0.492	24.997	27.366	1.055	34.568	37.613	1.880	<i>6.774</i>	<i>7.423</i>	<i>0.107</i>	15.266	16.625	0.457
	9	18.928	20.477	0.734	25.457	28.164	1.280	25.785	28.538	1.299	<i>7.813</i>	<i>8.606</i>	<i>0.164</i>	11.996	12.990	0.258
	1	16.653	17.781	0.616	12.139	13.031	0.218	11.802	12.688	<i>0.213</i>	<i>6.882</i>	<i>7.403</i>	<i>0.093</i>	8.666	9.291	0.156
	2	<i>20.808</i>	<i>22.316</i>	<i>0.645</i>	24.147	25.767	0.920	22.313	23.912	0.757	23.058	24.937	1.058	34.659	37.325	2.234

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Model		CNN			LSTM			GRU			MLP			Attention		
Input type	Group	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE	MAE	MAPE	MSE
	3	17.473	18.839	0.683	12.076	12.927	0.238	<i>8.538</i>	<i>9.160</i>	<i>0.109</i>	10.671	11.557	0.179	16.089	17.471	0.509
	4	22.815	24.445	0.968	<b>8.578</b>	<b>9.325</b>	<b>0.130</b>	<i>8.421</i>	<i>9.182</i>	<i>0.127</i>	14.867	16.204	0.502	9.934	10.796	0.195
	5	12.814	13.937	0.344	<i>6.810</i>	<i>7.442</i>	<b>0.079</b>	<b>7.207</b>	<i>7.797</i>	<b>0.075</b>	<b>10.403</b>	<b>11.283</b>	<b>0.178</b>	<b>11.340</b>	12.378	0.272
	6	21.942	23.693	0.960	11.165	12.055	<b>0.192</b>	<b>10.123</b>	<b>10.965</b>	<b>0.165</b>	<i>7.747</i>	<i>8.361</i>	<i>0.143</i>	11.478	12.366	0.320
	7	24.968	26.794	1.419	11.962	12.884	<i>0.229</i>	<i>10.696</i>	<i>11.599</i>	<i>0.196</i>	23.187	24.999	<b>0.907</b>	19.007	20.428	0.830
	8	15.131	16.447	0.451	17.279	18.606	0.494	15.194	16.367	0.366	<i>8.711</i>	<i>9.459</i>	<i>0.140</i>	10.069	10.918	0.198
	9	16.830	18.267	0.839	<b>8.779</b>	<b>9.532</b>	<b>0.119</b>	11.026	11.898	0.174	<i>7.911</i>	<b>8.588</b>	<i>0.105</i>	9.734	10.507	0.324
C	1	<i>6.072</i>	<i>6.554</i>	<i>0.064</i>	<b>6.455</b>	<b>6.957</b>	<b>0.067</b>	<b>10.940</b>	<b>11.891</b>	0.239	53.601	58.041	6.204	<b>7.951</b>	<b>8.607</b>	<b>0.119</b>
	2	<i>6.768</i>	<i>7.251</i>	<i>0.081</i>	<b>8.976</b>	<b>9.600</b>	<b>0.176</b>	<b>11.140</b>	<b>11.970</b>	<b>0.299</b>	87.473	93.580	23.135	<b>8.869</b>	<b>9.496</b>	<b>0.175</b>
	3	<b>11.559</b>	<b>12.510</b>	<b>0.205</b>	<b>11.146</b>	<b>12.080</b>	<i>0.190</i>	13.716	14.826	0.346	98.937	106.096	17.034	<i>11.088</i>	<i>11.961</i>	<b>0.204</b>
	4	<i>12.553</i>	<i>13.422</i>	<i>0.204</i>	13.660	14.625	0.269	13.120	14.078	0.265	76.932	81.989	11.607	13.066	13.969	0.235
	5	<i>8.785</i>	<i>9.421</i>	<i>0.120</i>	12.478	13.409	0.402	12.672	13.638	0.240	61.801	66.524	6.658	11.347	<b>12.163</b>	<b>0.195</b>
	6	<i>6.400</i>	<i>6.896</i>	<i>0.067</i>	<b>10.854</b>	<b>11.570</b>	0.383	11.167	11.915	0.366	35.105	37.564	2.069	<b>8.273</b>	<b>8.850</b>	<b>0.114</b>
	7	<i>8.218</i>	<i>9.011</i>	<b>0.122</b>	<b>8.355</b>	<b>9.186</b>	<i>0.110</i>	14.404	15.708	0.648	40.399	43.933	3.538	<b>11.269</b>	<b>12.304</b>	<b>0.290</b>
	8	<i>6.415</i>	<i>6.903</i>	<i>0.068</i>	<b>9.274</b>	<b>10.002</b>	<b>0.143</b>	<b>9.622</b>	<b>10.370</b>	<b>0.154</b>	37.891	40.835	2.342	<b>8.638</b>	<b>9.318</b>	<b>0.121</b>
	9	<i>7.152</i>	<i>7.678</i>	<i>0.077</i>	8.881	9.571	0.126	<b>9.505</b>	<b>10.234</b>	<b>0.161</b>	60.913	65.133	6.490	<b>7.525</b>	<b>8.067</b>	<b>0.090</b>

\* A is the charging data; B is the partial charging data; C is the handcraft features

**Note:** (1). All values are the average value of 3 experiments; (2). For intuitive display, all values have been magnified 1000 times.