

## Vehicle Feature Groups and Labels:

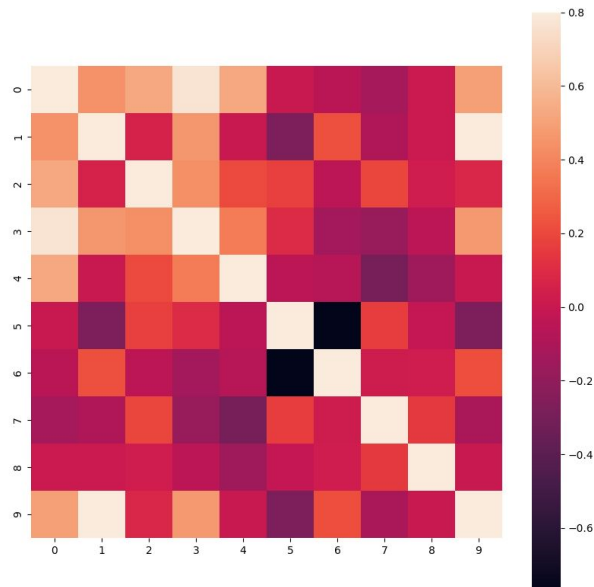
Groups	G1	G2	G3
<i>features</i>	engine_torque_percent engine_speed_rpm engine_torque_loss_percent cur_gear_pos	G1 + vehicle_speed_mps, brake_position_percent, retarder_actual_torque_percent, clutch_slip_rate_percent, combined_vehicle_weight_kg	engine_speed_rpm, engine_torque_percent, cur_gear_pos, retarder_actual_torque_percent
<i>label-1</i>	0x721_Ins_flow_rate		
<i>label-2</i>	0x18fef2fe_EngFuelRate		

**Definition:**  $accuracy = 1 - median\_absolute\_error / mean$

## Correlation Analysis:

Features:

engine\_speed\_rpm, engine\_torque\_percent, engine\_torque\_loss\_percent, cur\_gear\_pos,  
vehicle\_speed\_mps, brake\_position\_percent, retarder\_actual\_torque\_percent,  
clutch\_slip\_rate\_percent, combined\_vehicle\_weight\_kg



**G3:** engine\_speed\_rpm, engine\_torque\_percent, cur\_gear\_pos, retarder\_actual\_torque\_percent

## Results with label-1 (Ins\_flow\_rate):

### G1 results (5 fold average value):

Table 1 Group-1 with label-1

Condition	Metrics	LR	PR	MLP	CNN	LSTM	CNN-LSTM
With Idling state	R2	0.8705	0.6090	0.9273	0.9260	<b>0.9472</b>	0.9454
	accuracy	0.8964	0.9393	0.9393	<b>0.9564</b>	0.9528	0.9475
Without idling state	R2	0.8632	0.6092	0.9218	0.9213	<b>0.9483</b>	0.9278
	accuracy	0.8853	0.9315	0.9578	0.953	0.8295	<b>0.9648</b>

### G2 results (5 fold average value):

Table 2 Group-2 with label-1

Condition	Metrics	LR	PR	MLP	CNN	LSTM	CNN-LSTM
With Idling state	R2	neg	neg	0.8412	0.9027	<b>0.9204</b>	0.9160
	accuracy	neg	neg	0.9398	0.9528	0.8321	<b>0.9533</b>
Without idling state	R2	neg	neg	0.8898	0.9235	<b>0.9508</b>	0.9310
	accuracy	neg	neg	0.9558	<b>0.9604</b>	0.8171	0.9486

### G3 results (5 fold average value):

Table 2 Group-3 with label-1

Condition	Metrics	LR	PR	MLP	CNN	LSTM	CNN-LSTM
With Idling state	R2	0.8674	0.9225	0.9236	0.9278	<b>0.9434</b>	0.9379
	accuracy	0.8779	0.9346	0.9548	0.9557	0.8447	<b>0.9562</b>
Without idling state	R2	0.8646	0.8121	0.9212	0.9165	<b>0.9481</b>	0.9213
	accuracy	0.8904	0.9333	<b>0.9646</b>	0.9541	0.8247	0.9375

## Results with label-2 (Engine Fuel Rate):

### G1 results (5 fold average value):

Table 3 Group-1 with label-2

Condition	Metrics	LR	PR	MLP	CNN	LSTM	CNN-LSTM
With Idling state	R2	0.9435	0.9394	0.9655	0.9659	0.9561	<b>0.9709</b>
	accuracy	0.9227	0.9687	0.9705	<b>0.9734</b>	0.8756	0.9717
Without idling state	R2	0.9397	0.9305	0.9597	0.9626	0.9561	<b>0.9656</b>
	accuracy	0.9332	0.9711	0.9698	0.9738	0.8547	<b>0.9762</b>

### G2 results (5 fold average value):

Table 4 Group-2 with label-2

Condition	Metrics	LR	PR	MLP	CNN	LSTM	CNN-LSTM
With Idling state	R2	neg	neg	0.9328	0.9538	0.9426	<b>0.9561</b>
	accuracy	neg	neg	0.9741	0.9755	0.8701	<b>0.9807</b>
Without idling state	R2	neg	neg	0.9453	0.9448	0.9576	<b>0.9598</b>
	accuracy	neg	neg	0.9734	<b>0.9774</b>	0.8662	0.9716

### G3 results (5 fold average value):

Table 4 Group-3 with label-2

Condition	Metrics	LR	PR	MLP	CNN	LSTM	CNN-LSTM
With Idling state	R2	0.9436	0.9547	0.9668	<b>0.9680</b>	0.9494	0.9657
	accuracy	0.9201	0.9686	<b>0.9760</b>	0.9716	0.8346	0.9688
Without idling state	R2	0.9409	0.9325	0.9657	0.9644	0.9546	<b>0.9693</b>
	accuracy	0.9343	0.9695	<b>0.9752</b>	0.9717	0.8608	0.9704