



# MOBILITY SENSING AND DATA ANALYTICS FOR SMART CITIES

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# BACKGROUND INFORMATION

- Smart Cities
- Mobility Sensing
- Economic Development
- Service Optimization

# MobIntel

# 

#### How it works

- Sensors
- MAC Address
- RSSI
- Privacy-First



#### Challenges

- Unchecked Data
- Loss of Power







#### **PROJECT GOALS**





#### Determine Sensor Power

# $\sim$

#### Verify Data

Compare with Google

Maps Popular Times and Sensor Correlation Trendline Forecasting

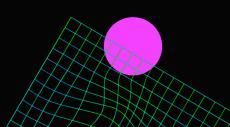
#### **Describe Data**

Seaborn and Matplotlib

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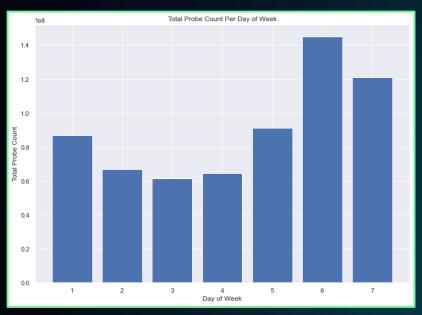


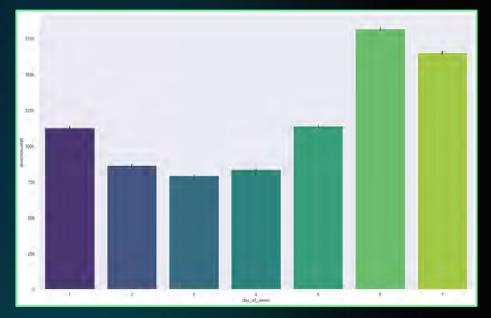


## PROBE COUNTS PER DAY OF WEEK

#### Tot al

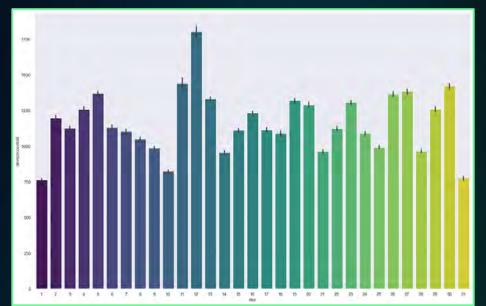
Average





## PROBE COUNTS PER DAY

#### Average

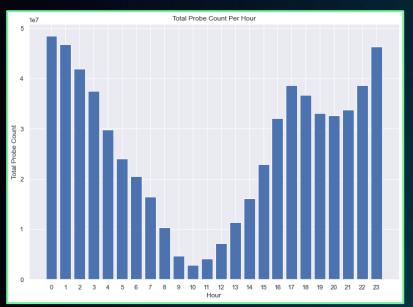


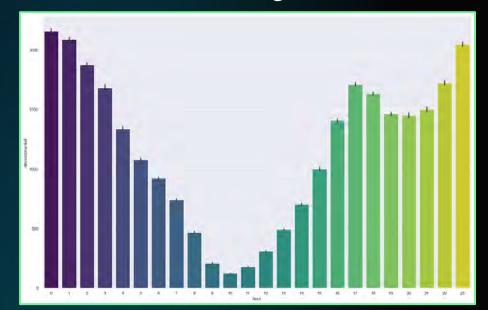


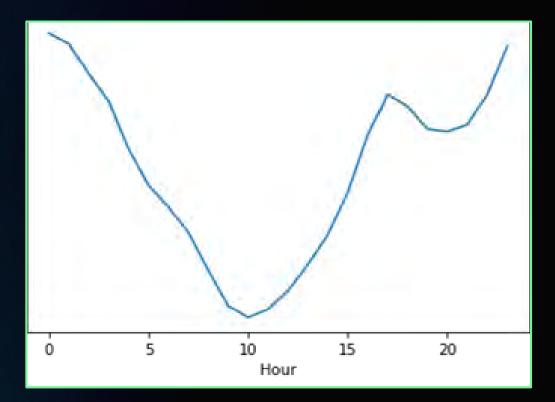
# PROBE COUNTS PER HOUR

#### Tot al

#### Average









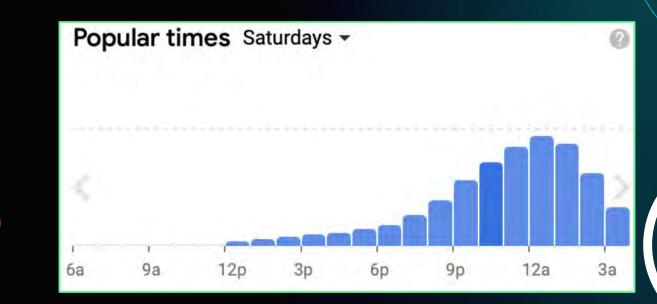


# SENSOR CORRELATION

	-	_	_	_	-		_	_				_	_		_	_	_		- 1.00
sensor_01	1	0.9.8	0.95	0.87			0.78	0.93	0.77				0.94			0.69	0.76	0.87	
sensor_02		-t	0.96	0.83			0.77	0.87	0.77				0.89	0.77	0.8	0.71	0.77		
sensor_05			1	0.84	0.79	0.78	0.82	0.88	0.81			0.78	0.9	0.86	0.87		0.82	0.93	- 0.95
sensor_10	0.87	0.83	0.84	1	0.91	0.9	0.92	0.91	0.92	0.88	0.9	0.88		0.81	0.81	0.81	0.86	0.8	- 0.35
sensor_12			0.79	0.91	đ	0.96		0.77	0.96	0.93		0.93	0.82	0.84	0.86	0.88	0.91		
sensor_13			0.78	0.9	0.96	1	0.96	0.77	0.95				0.81	0.85	0.86	0.88	0.92	0.77	- 0.90
sensor_14	0.78	0.77	0.82	0.92		0,96	4	0.81	0.97	0.92			0.84	0.85	0.86	0.88	0.91	0.78	0.50
sensor_15	0,93	0.87	0.88	0.91	0.77	0.77	0.81	1	0.8	0,77	0.77		0.97	0.72	0,72	0.7	0.76	0.8	
sensor_16	0.77	0.77	0.81	0.92	0.96		0.97	0.8	1	0.93			0.83	0.85	0.86	0.88	0.91	0.78	- 0.85
sensor_17			0.75	0.88	0.93		0.92	0.77	0.93	1			0.8	0.87	0.87	0.92			0.00
sensor_18				0.9		0.97		0.77		0.95	1		0.82	0.84	0.85	0.88	0.92		
sensor_19			0.78	0.88	0.93						0.95	1	0.8	0.89	0.89	0.93	0.95	0.77	- 0.80
sensor_26		0.89	0.9	0.94	0.82	0.81	0.84	0.97	0.83	0.8	0.82	0.8	1	0.75		0.73	0.78	0.83	
sensor_43		0.77	0.86	0.81	0.84	0.85	0.85		0.85	0.87	0.84	0.89	0.75	1	0.92	0.88	0.91	0.79	
sensor_46		0.8	0.87	0.81	0.86	0.86	0.86		0.86	0.87	0.85	0.89		0.92	1	0.88		0.83	- 0.75
sensor_47	0.69	0.71	0.76	0.81	0.88	0.88	0.88	0.7	0.88	0.92	0.88	0.93		0.88	0.88	1	0.54	0.73	
sensor_48	0.76	0.77	0.82	0.86	0.91	0.92	0.91	0.76	0.91		0.92		0.78	0.91	0.94	0.94	1	0.79	
sensor_51	0.87		0.93	0.8		0.77	0.78	0.8	0.78			0.77	0.83	0.79	0.83		0.79	1	- 0.70
	sensor_01	sensor_02	sensor_05	sensor_10	sensor_12	sensor_13	sensor_14	sensor_15	sensor_16	sensor_17	sensor_18	sensor_19	sensor_26	sensor_43	sensor_46	sensor_47	sensor_48	sensor_51	



## GOOGLE MAPS POPULAR TIMES



# TRENDLINE FORECASTING

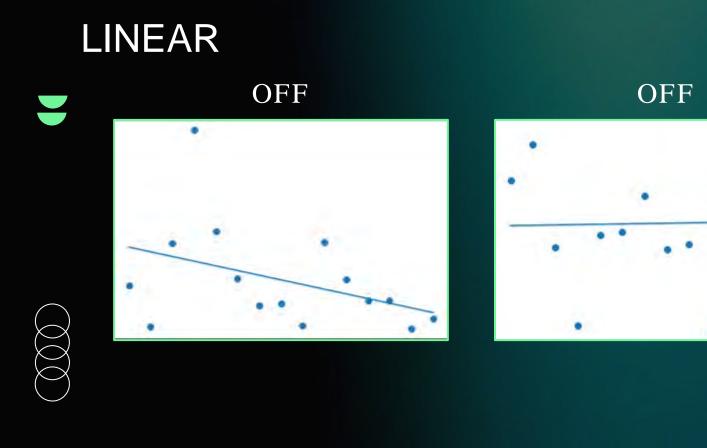
 Calculating next value from trendline of previous data points



#### LINEAR

• First-Order

• Second-Order

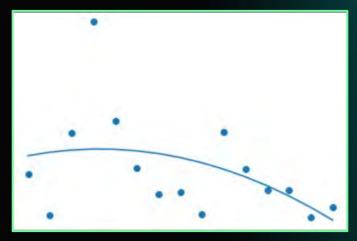


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# QUADRATIC

ON





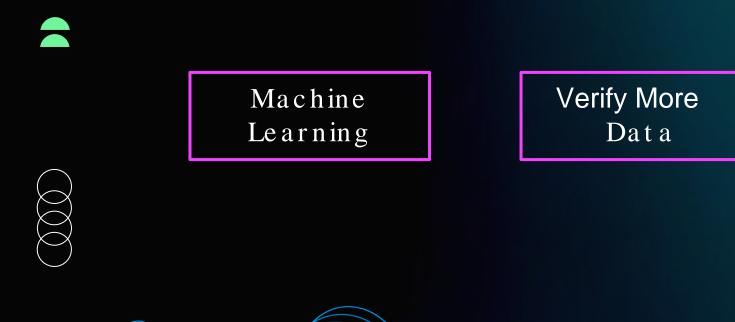


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## FUTURE PROJECT GOALS



# Thanks

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