

Predicting I-70 Traffic

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Problem Space

- Predicting I-70 Hourly Traffic
- Features:
 - Month
 - Year
 - Day
 - Day of Week
 - Hour
 - Snow Depth
 - Daily Snow Total
- Target
 - Traffic Volume

Approach

- Data Collection and Transformation
- Model Selection and Training
 - Neural Network, TensorFlow Library
 - Sequential Model
 - ReLU Activation
 - Multiple Dense Layers
 - Dropout Regularization
 - Mean Squared Logarithmic Error Loss Function
 - Adam Optimizer
- Evaluation
 - Trained for 20 Epochs
 - Batch size of 64

Data

Winter Park Daily Snow¹:

Day	Jan	Feb	Mar	Apr	May
1	0	0	0	0	0
2	0	0	0	0	0
3	0	0	0	0	1.5
4	2	11	1.5	0	0
5	T	4.5	4	0	2
6	2	6	0	0	0
7	0	T	0	0.5	0
8	0	0	0	0	0
9	0	0	0	0	0
10	0	T	7	0	2

Traffic Volume²:

COUNTDATE	COUN...	HOUR0	HOUR1
20170101	P	138	106
20170101	S	138	151
20170102	P	145	100
20170102	S	115	94
20170103	P	136	92
20170103	S	153	97
20170104	P	53	151
20170104	S	73	96
20170105	P	75	77
20170105	S	110	96
20170106	P	85	63
20170106	S	143	98

Results

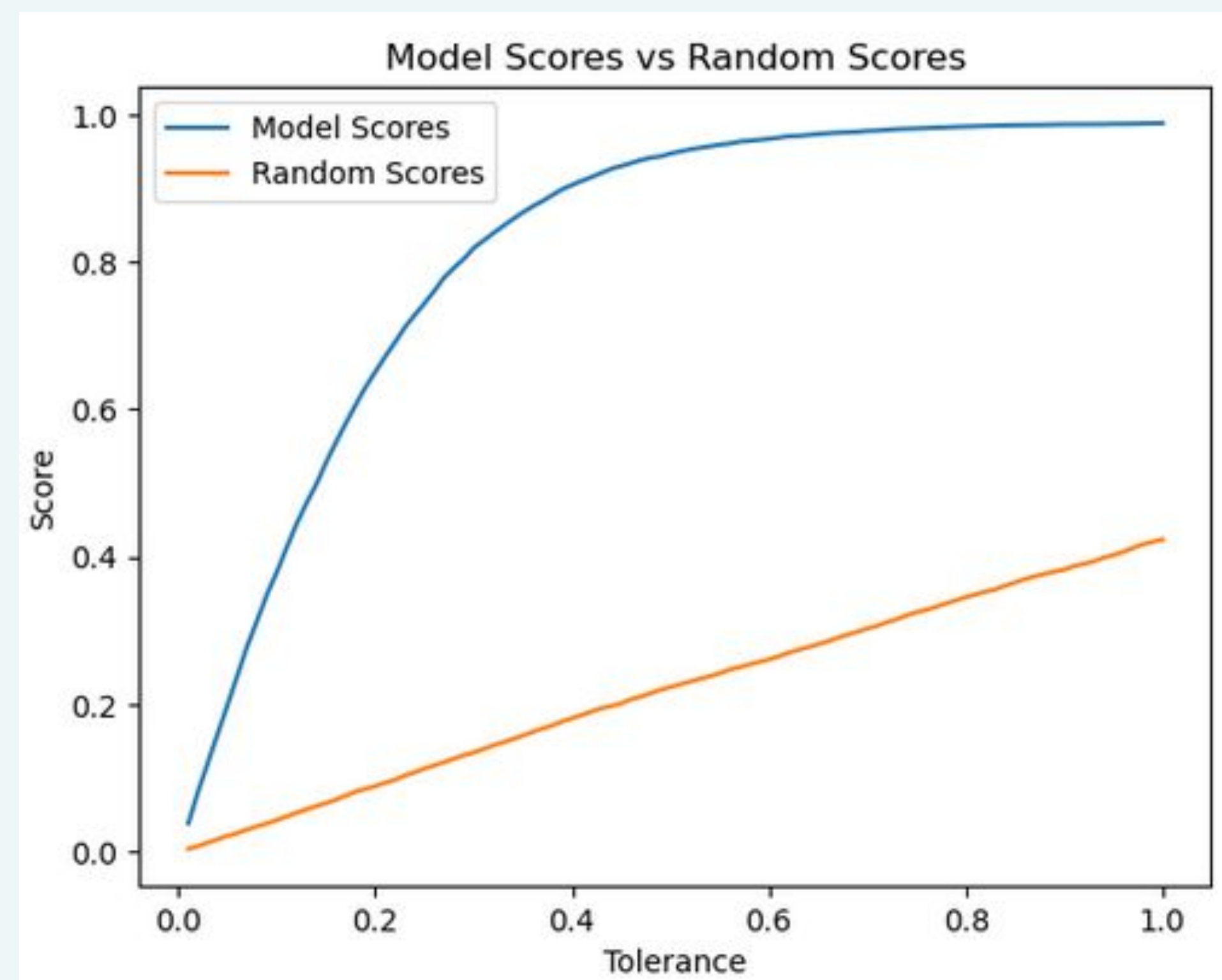
Random score for a tolerance of 10.0%: 0.025
Model score for a tolerance of 10.0%: 0.3626

Random score for a tolerance of 15.0%: 0.0363
Model score for a tolerance of 15.0%: 0.5149

Random score for a tolerance of 20.0%: 0.0461
Model score for a tolerance of 20.0%: 0.6433

Random score for a tolerance of 30.0%: 0.0677
Model score for a tolerance of 30.0%: 0.8181

Random score for a tolerance of 40.0%: 0.0906
Model score for a tolerance of 40.0%: 0.9117



R-squared: 0.8719040692663718
Adjusted R-squared: 0.871798875517529
Root Mean Squared Logarithmic Error: 0.31510702921487665

Discussion

- Past Work³:

Friday WB – No volume-related delays are expected.

Friday EB – No volume-related delays are expected.

Saturday WB – No volume-related delays are expected.

Saturday EB – No volume-related delays are expected.

Sunday WB – No volume-related delays are expected.

Sunday EB – No volume-related delays are expected.

**The GoI70.com Travel Forecast is based on historical data, along with an estimation of how weather, construction, public events and other factors might impact travel.*

- Differences:
 - Hourly Predictions
 - By-Station Predictions
- Impact in Field:
 - Consumer Predictions
 - Infrastructure Planning
- Future Work:
 - Add predictors: Construction, Public Events and Holidays
 - Create an app for consumers to predict traffic

References

- (1) “Daily Summaries Station Details.” *Daily Summaries Station Details: WINTER PARK, CO*
US, GHCND:USC00059175 | *Climate Data Online (CDO)* | *National Climatic Data Center (NCDC)*, National Oceanic and Atmospheric Administration,
<https://www.ncdc.noaa.gov/cdo-web/datasets/GHCND/stations/GHCND:USC00059175/detail>.
- (2) “CDOT-Otis Online Transportation Information System.” *Traffic Data Explorer*, Online
Transportation Information System,
<https://dtdapps.coloradodot.info/otis/trafficdata#ui/2/0/0/station/000120/criteria/000120/>.
- (3) “Travel Forecast.” *goi70*, CSBOX, 4 May 2023,
<https://goi70.com/travel>.