Fetal Health Classification
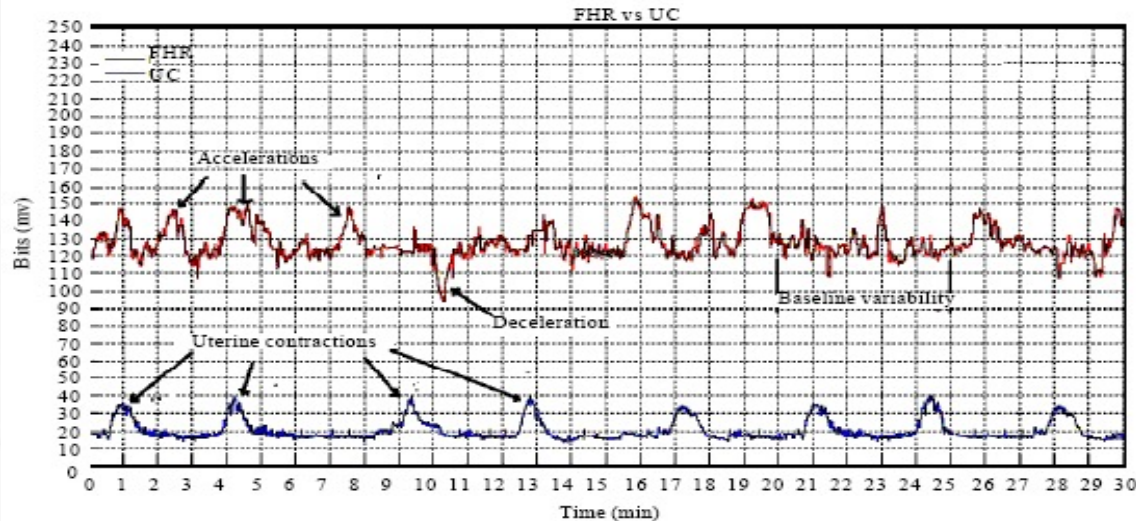## using CTG Data

By Pengju Sun
04/21/2021

"Fetal mortality is a major, and often overlooked, public health problem."

-The Challenge of Fetal Mortality, NCHS Data Brief No. 16, April 2009
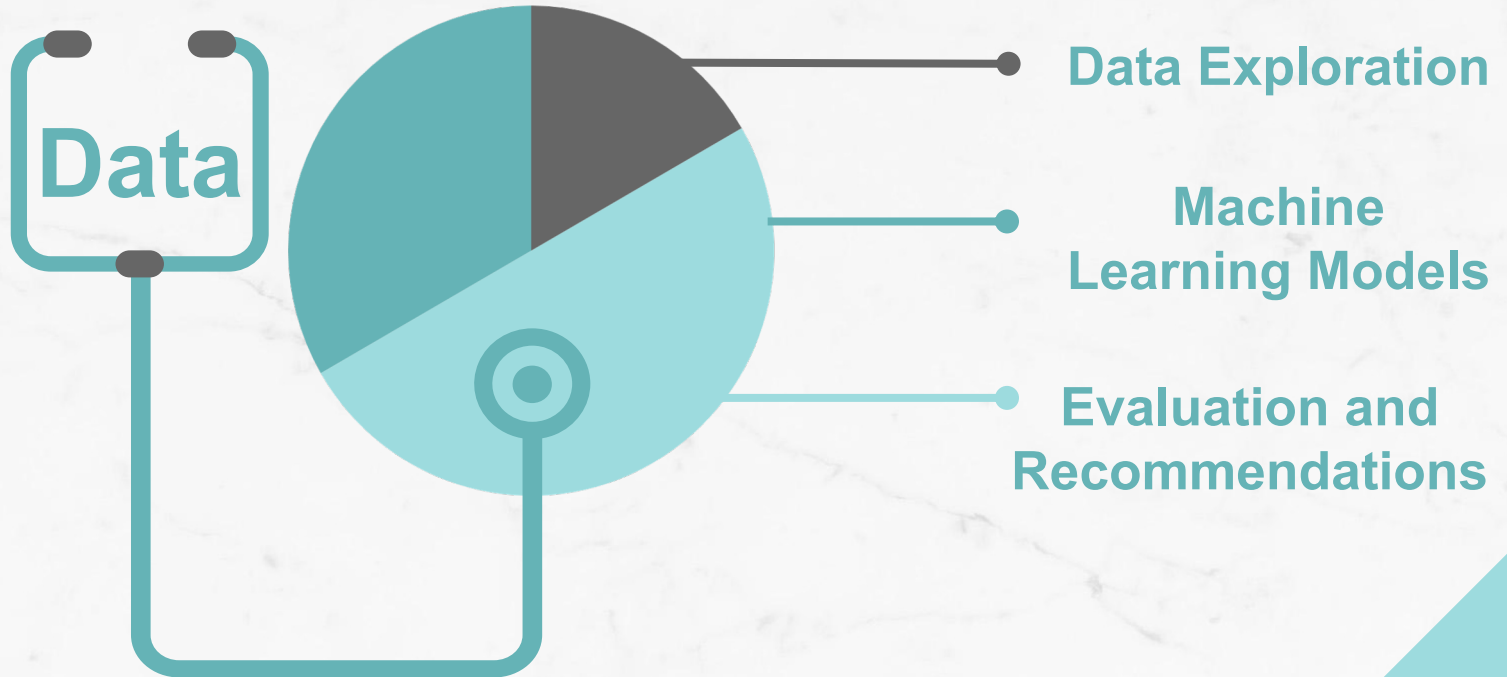
Cardiotocograms

also known as CTGs or fetal trace reports

Questions

- Can CTGs as a way of preventative care help predict fetal health ?

- If so, which measurements are the most significant when predicting fetal health outcomes?
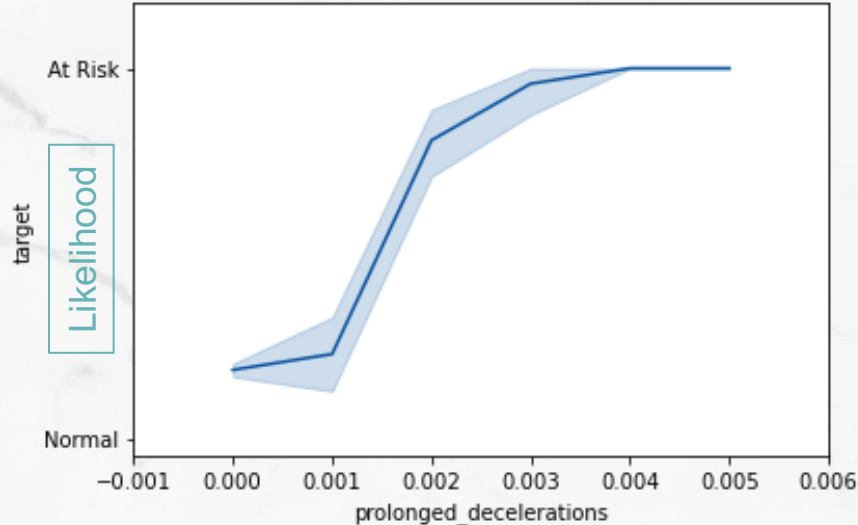
Methods

Data

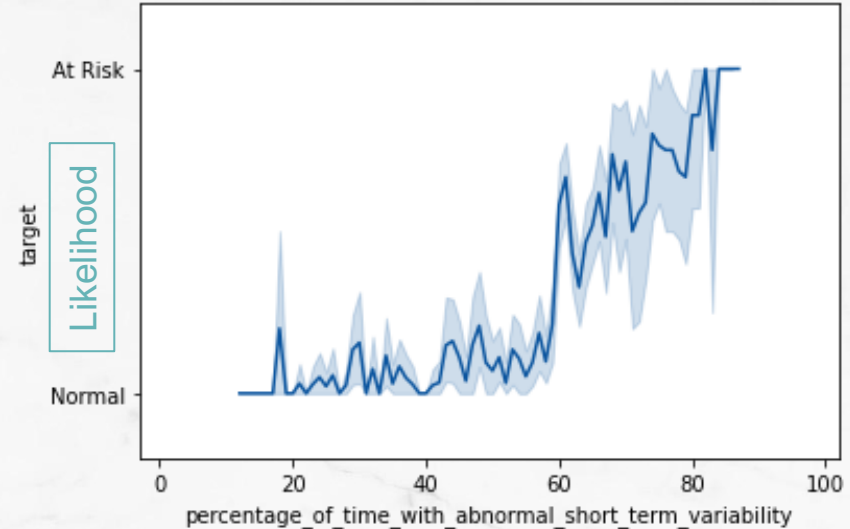- Data Exploration
- Machine Learning Models
- Evaluation and Recommendations

Significant Features

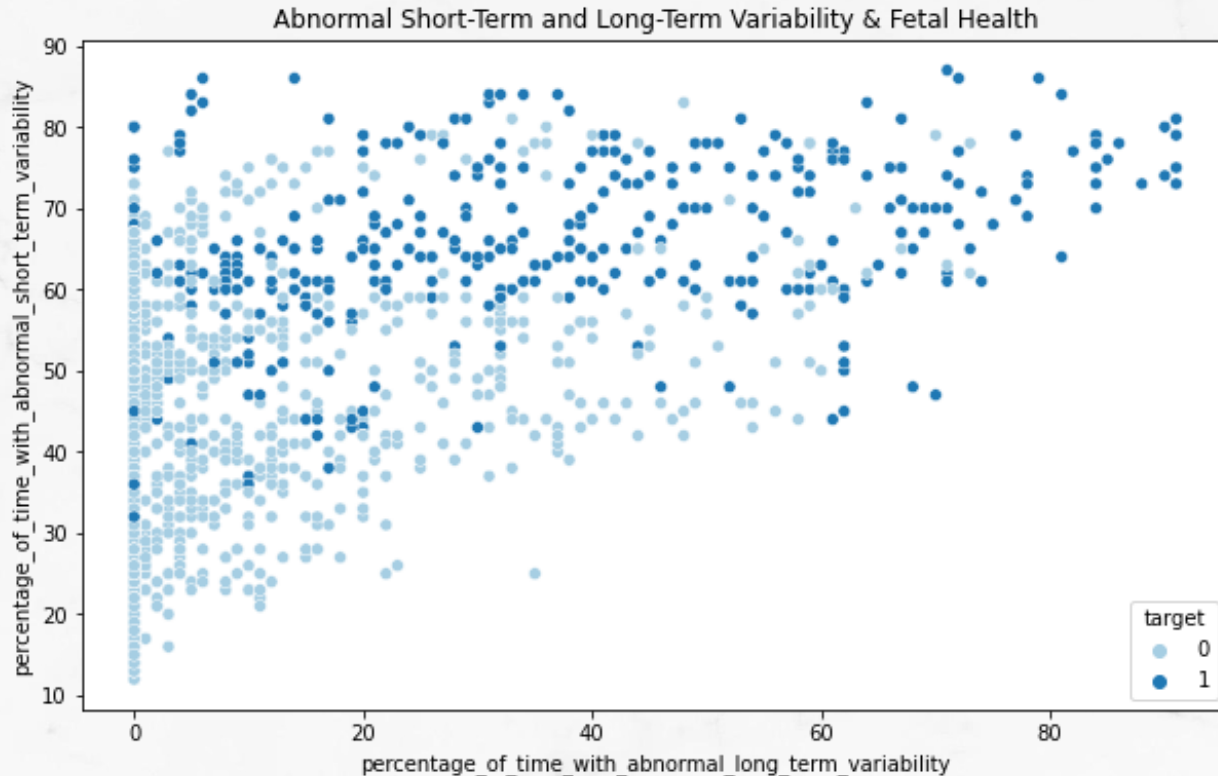|	fetal_health
fetal_health	1.000000
prolonged_decelerations	0.484859
percentage_of_time_with_abnormal_short_term_variability	0.471191
percentage_of_time_with_abnormal_long_term_variability	0.426146
histogram_variance	0.206630
baseline_value	0.148151
severe_decelerations	0.131934
fetal_movement	0.088010
histogram_min	0.063175
light_decelerations	0.058870
histogram_number_of_zeroes	-0.016682
histogram_number_of_peaks	-0.023666
histogram_max	-0.045265
histogram_width	-0.068789
mean_value_of_short_term_variability	-0.103382
histogram_tendency	-0.131976
uterine_contractions	-0.204894
histogram_median	-0.205033
mean_value_of_long_term_variability	-0.226797
histogram_mean	-0.226985

Significant Features

Significant Features

Abnormal Short-Term and Long-Term Variability & Fetal Health

Model Test Results

Conclusion

- Cardiotocogram data provides easily accessible and interpretable insight into fetal health outcomes.

- Machine learning models are able to predict if a fetus is in distress, using CTG data, with a high level of recall/sensitivity.

Recommendations

Perform CTGs as often as possible

1

Pay close attention fetal heart rate (FHR) variability

2

Treat all indicators of at-risk with urgency

3

Future Work

1 More Observations

2 Explore Histograms

3 Add new features

THANKS

Do you have any questions?
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Githubhttps: github.com/pjsun2012