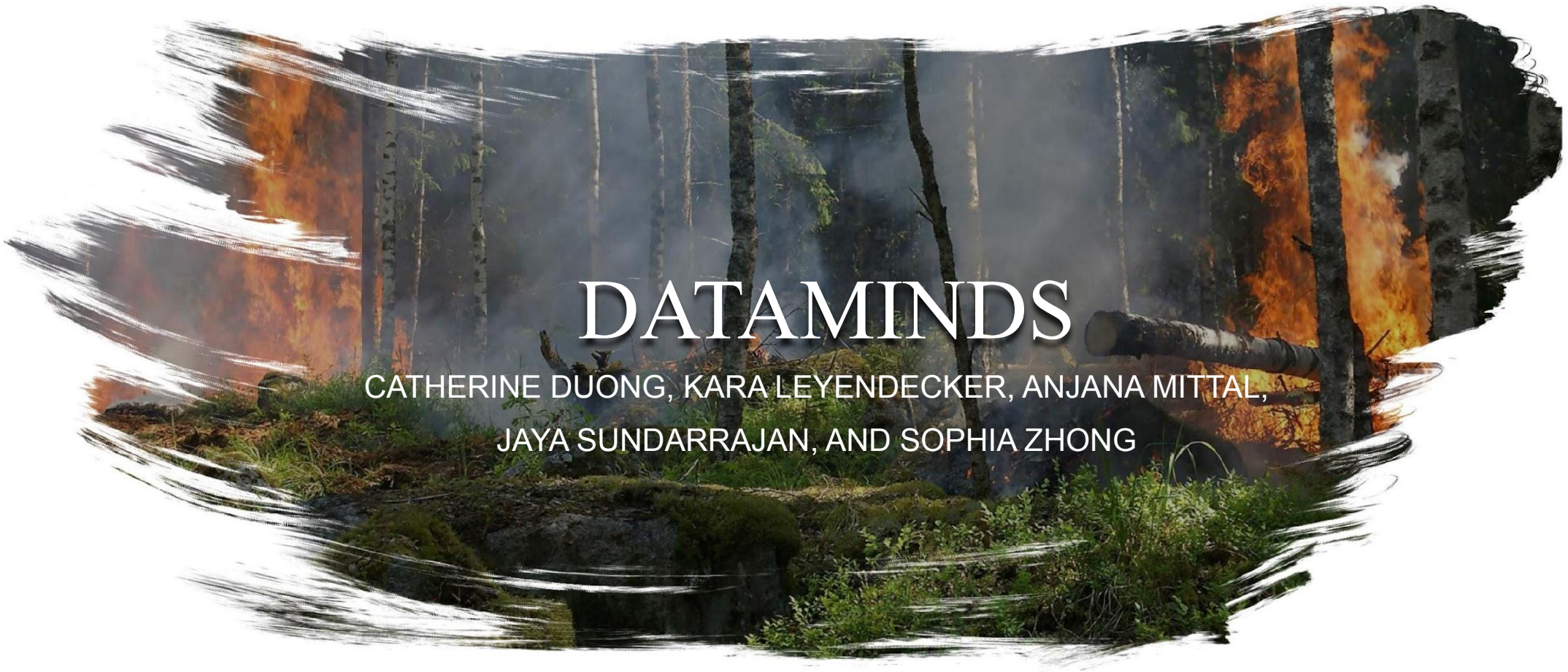
FORECASTING WILDFIRES

DATA SCIENCE SOLUTIONS FOR ACCURATE PREDICTION AND COMMUNICATION



DATAMINDS

CATHERINE DUONG, KARA LEYENDECKER, ANJANA MITTAL,
JAYA SUNDARRAJAN, AND SOPHIA ZHONG

PROJECT OBJECTIVES

DATA VISUALIZATION & ANALYSIS

WILDFIRE PREDICTOR ALGORITHM

COMMUNICATION WITH END-USERS

EXPLORATORY DATA ANALYSIS

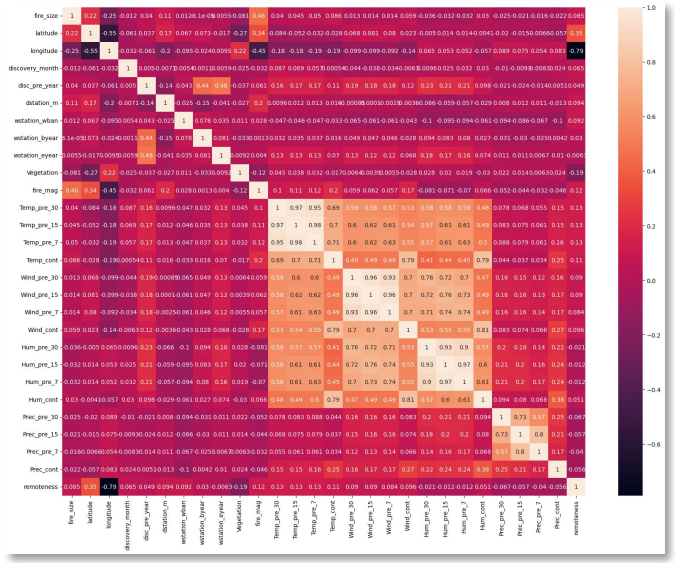
DATA GATHERING

fire_size	fire_size_class	stat_cause_desc	latitude	longitude	state	putout_time	disc_date_pre	disc_pre_year	disc_pre_month	fire_mag	weather_file	Temp_cont	Wind_cont	Hum_cont	Prec_cont	remoteness
10	C	Missing/Undefin	18.105072	-66.753044	PR		1/12/2007	2007	Jan	1	785140-11603-2	24.52796053	3.250413223	78.72436975	0	0.01792338769
3	B	Arson	35.03832998	-87.60999999	TN		11/11/2006	2006	Nov	0.1	723235-13896-2	10.4482976	2.122320303	81.68267831	86.8	0.1843549519
60	C	Arson	34.9478	-88.7225	MS		1/30/2004	2004	Jan	1	723235-13896-2	13.69660023	3.36905041	65.06380028	124.5	0.1945435135
1	B	Debris Burning	39.6414	-119.3083	NV	0 days 00:00:00.	5/7/2005	2005	May	0.1	724880-23185-2	0	0	0	0	0.4874474549
2	B	Miscellaneous	30.7006	-90.5914	LA		8/23/1999	1999	Aug	0.1	File Not Found	-1	-1	-1	-1	0.2146329449
1	B	Debris Burning	32.0639	-82.4178	GA		2/20/1999	1999	Feb	0.1	File Not Found	-1	-1	-1	-1	0.1396431681
5.2	B	Debris Burning	31.31697802	-83.39364888	GA		12/11/2008	2008	Dec	0.1	747810-13857-2	0	0	0	0	0.1489038254
1	B	Campfire	30.90472001	-93.55749999	TX		10/13/2005	2005	Oct	0.1	722820-99999-2	11.98555957	2.148856799	70.73291139	55.4	0.2418935055
1	B	Arson	35.90031	-92.06118	AR		7/9/2007	2007	Jul	0.1	723448-53934-2	28.68268759	2.10308975	60.19685812	46.4	0.224629406
1	B	Miscellaneous	48.8394	-99.7185	ND	0 days 00:00:00.	3/20/2004	2004	Mar	0.1	727675-99999-2	0	0	0	0	0.2916826267
8.3	B	Debris Burning	30.84533929	-83.12798679	GA		2/4/2010	2010	Feb	0.1	722166-93845-2	14.32804746	1.750701187	73.07207207	40.5	0.1468883522
37	C	Arson	31.195108	-88.150651	AL	0 days 00:00:00.	1/13/2015	2015	Jan	1	File Not Found	-1	-1	-1	-1	0.1919230782
1	B	Debris Burning	33.85573991	-85.31107517	GA		9/13/2003	2003	Sep	0.1	723200-93801-2	0	0	0	0	0.1643146744
1	B	Fireworks	31.76738	-93.14687	LA		6/6/2014	2014	Jun	0.1	722319-53943-2	26.92730263	1.382182018	76.70679183	56.2	0.2374312087
3	B	Missing/Undefin	32.775	-80.65833333	SC	0 days 00:00:00.	4/12/1993	1993	Apr	0.1	File Not Found	-1	-1	-1	-1	0.1235178347
1	B	Missing/Undefin	33.98860931	-103.1352768	NM		1/13/1996	1996	Jan	0.1	722686-23008-1	8.396809986	6.062726008	33.53760446	0	0.3303233823
1.5	B	Children	36.0833	-78.9167	NC		3/17/2001	2001	Mar	0.1	File Not Found	-1	-1	-1	-1	0.1060351613
1	B	Miscellaneous	36.1647	-91.8397	AR		7/31/2000	2000	Jul	0.1	999999-94818-2	0	0	0	0	0.2224276661
1	B	Missing/Undefin	35.73848	-79.49695	NC		1/23/2007	2007	Jan	0.1	723174-93783-2	9.931642512	3.007524272	54.83645443	90.2	0.1113427085
10	C	Arson	31.5667	-90.5089	MS		6/14/2000	2000	Jun	1	File Not Found	-1	-1	-1	-1	0.2132177605
2	B	Missing/Undefin	18.130913	66.472954	PR		1/29/2007	2007	Jan	0.1	File Not Found	-1	-1	-1	-1	0.01555156932

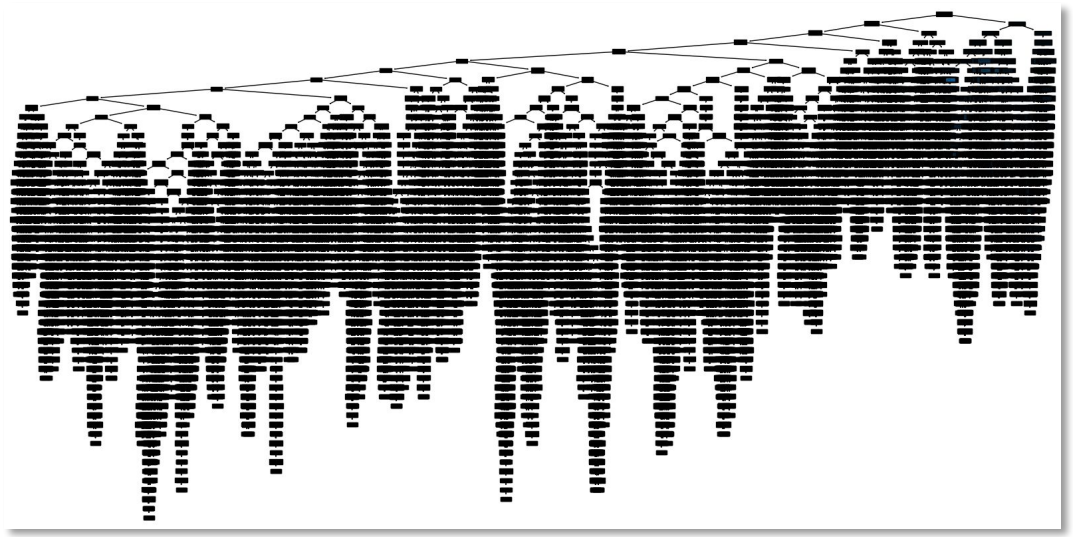
EXPLORATORY DATA ANALYSIS

DATA GATHERING

DATA CLEANING

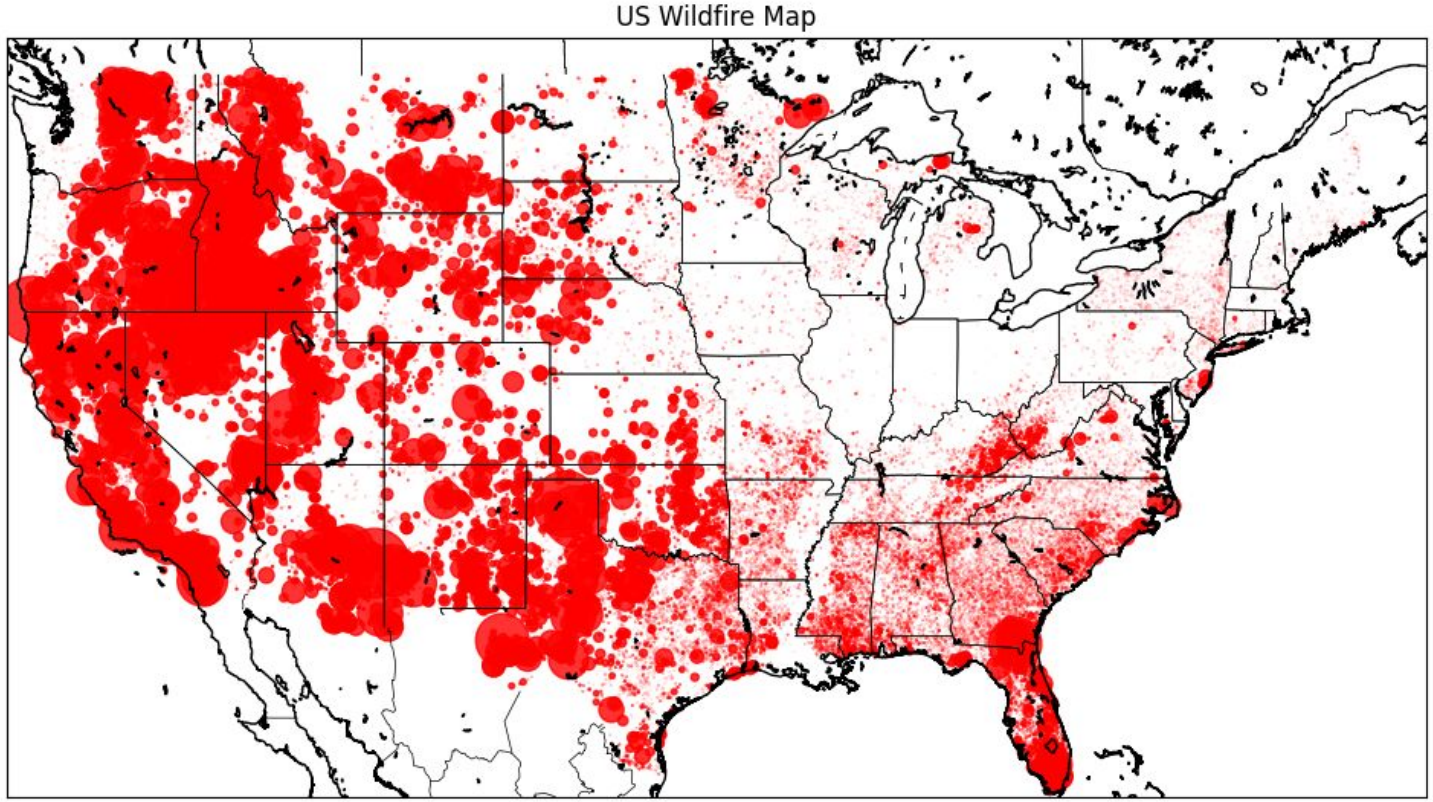


EXPLORATORY DATA ANALYSIS



DATA VISUALIZATION

DATA VISUALIZATION



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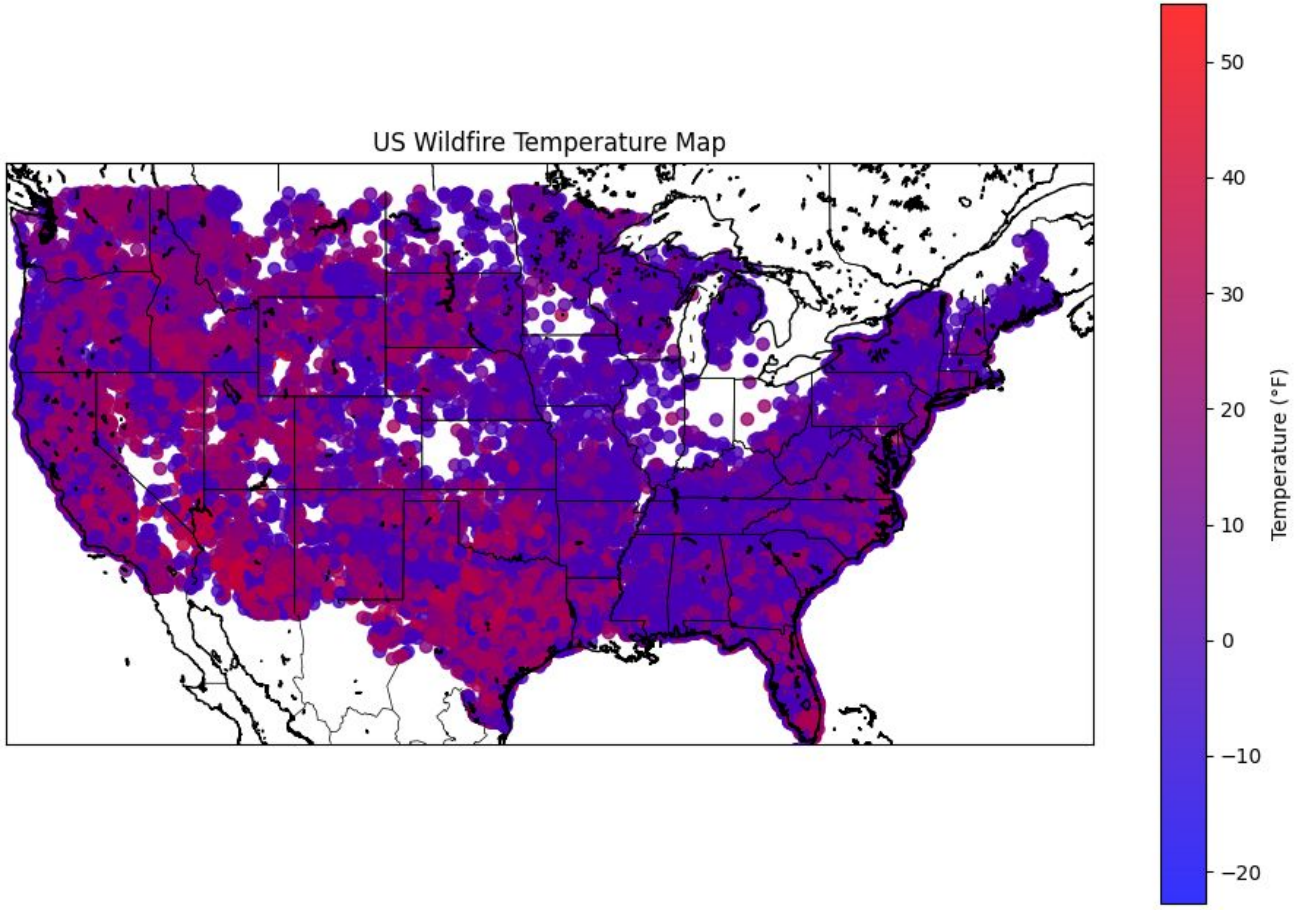

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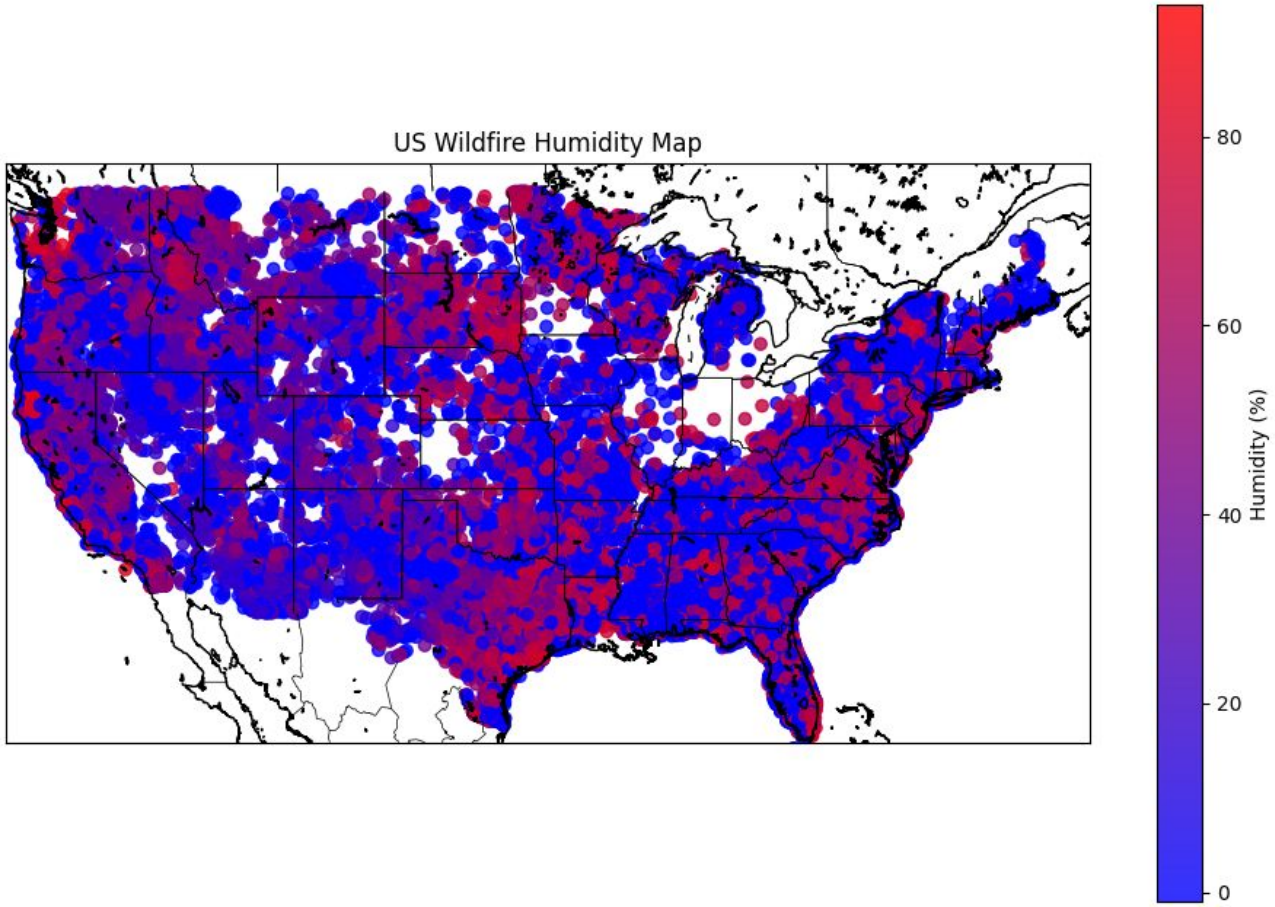

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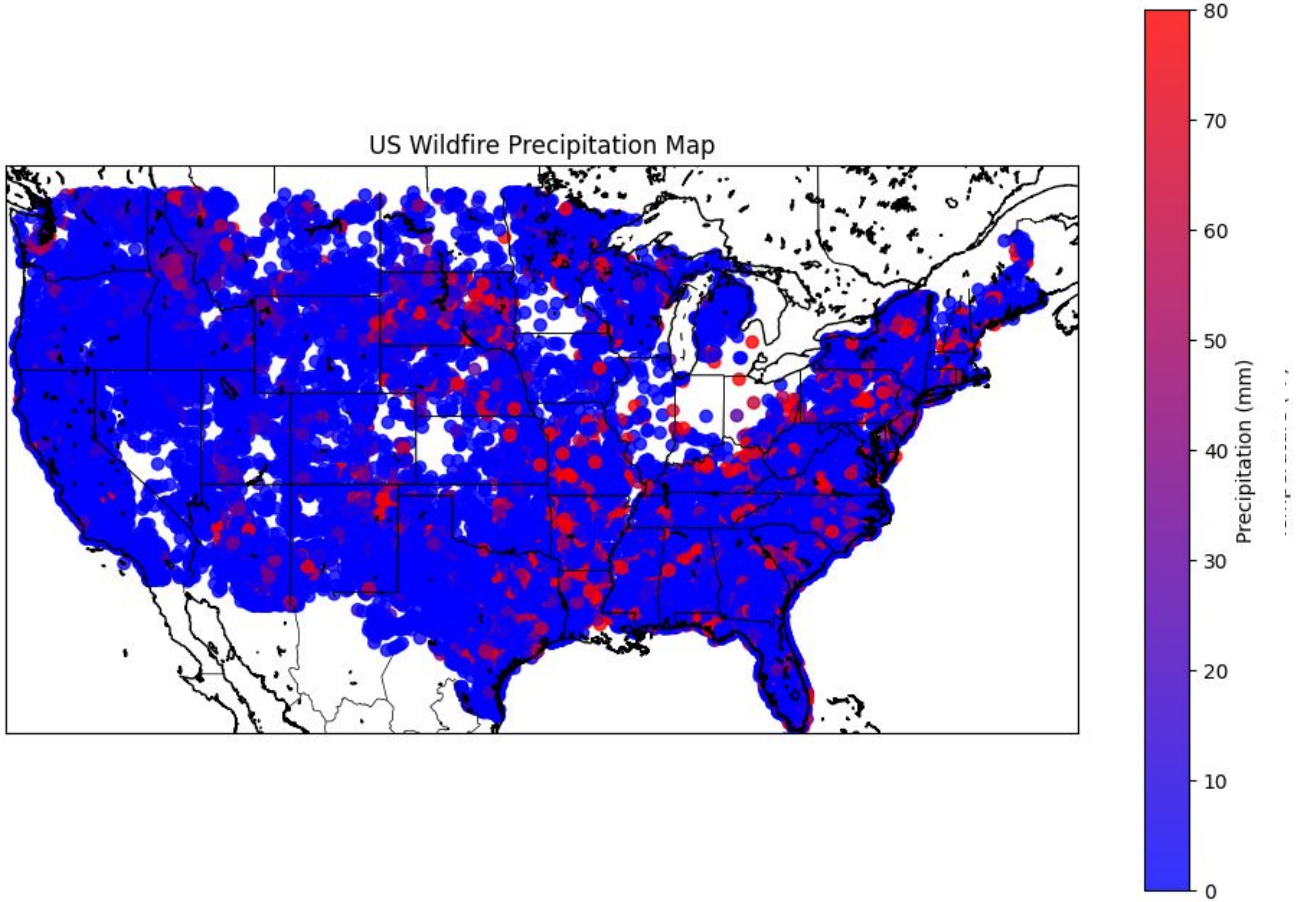

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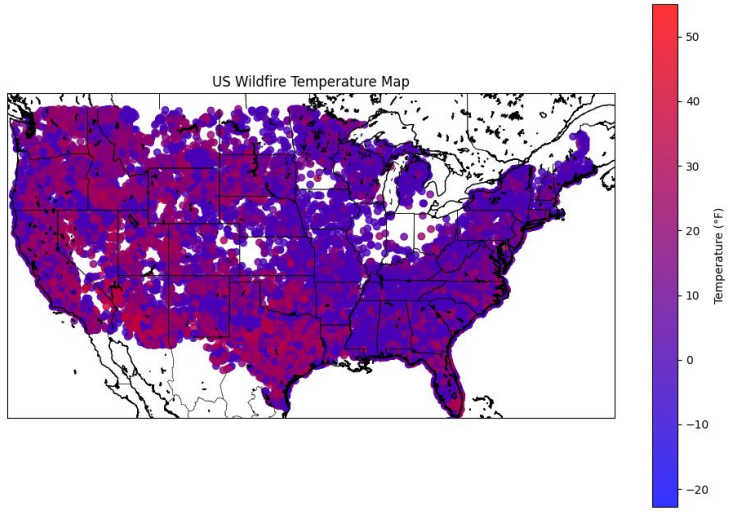

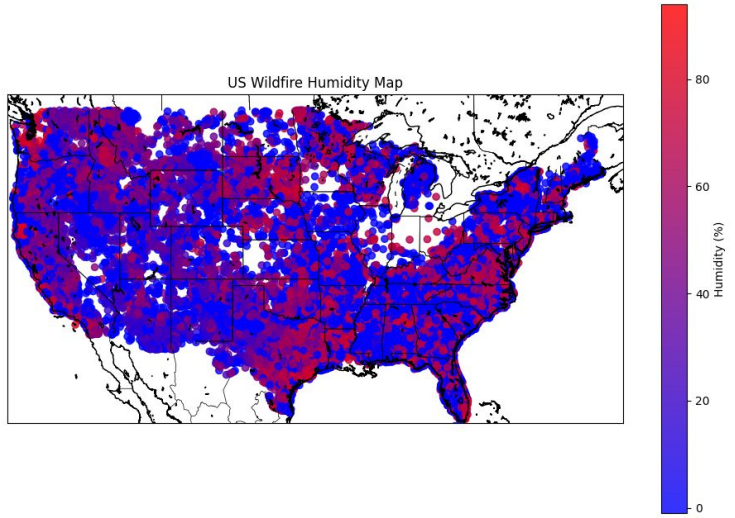

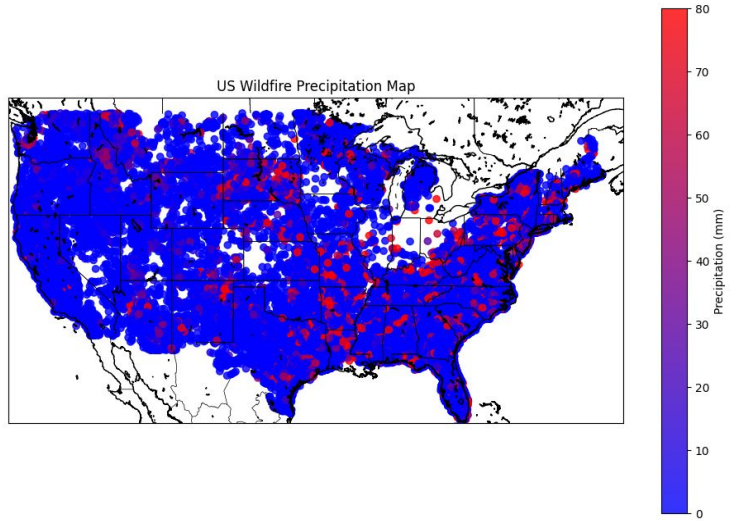

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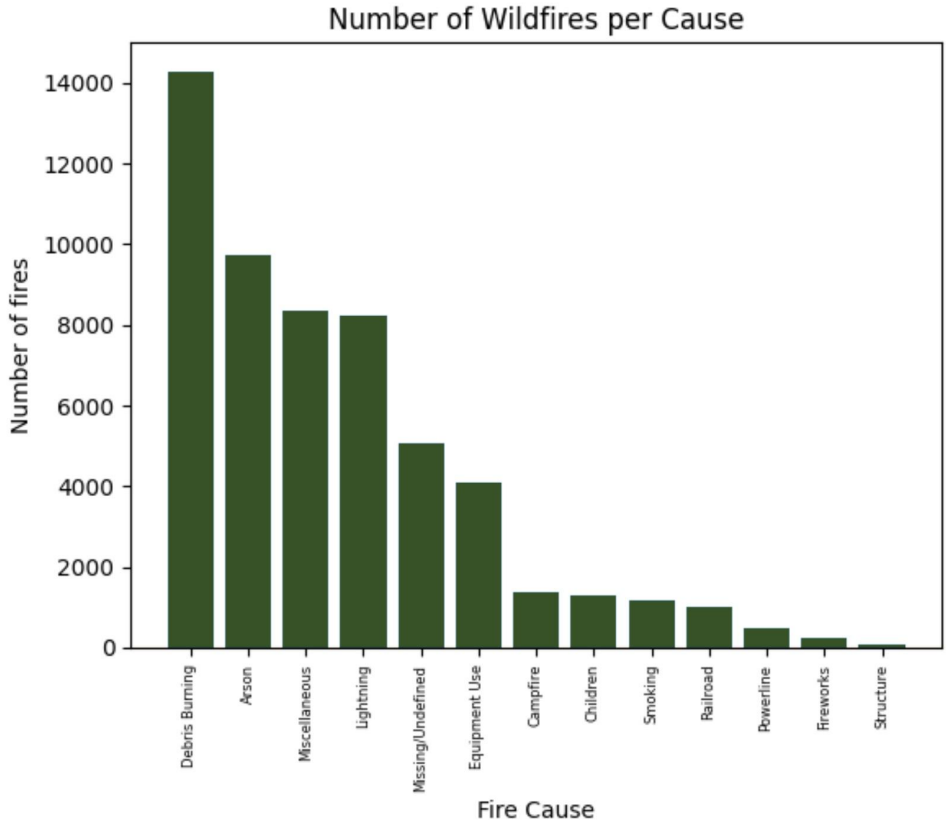
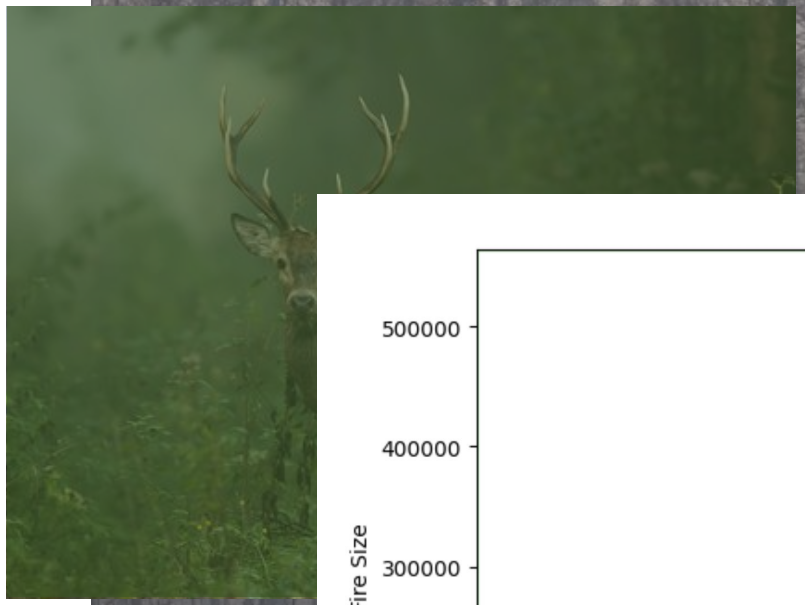


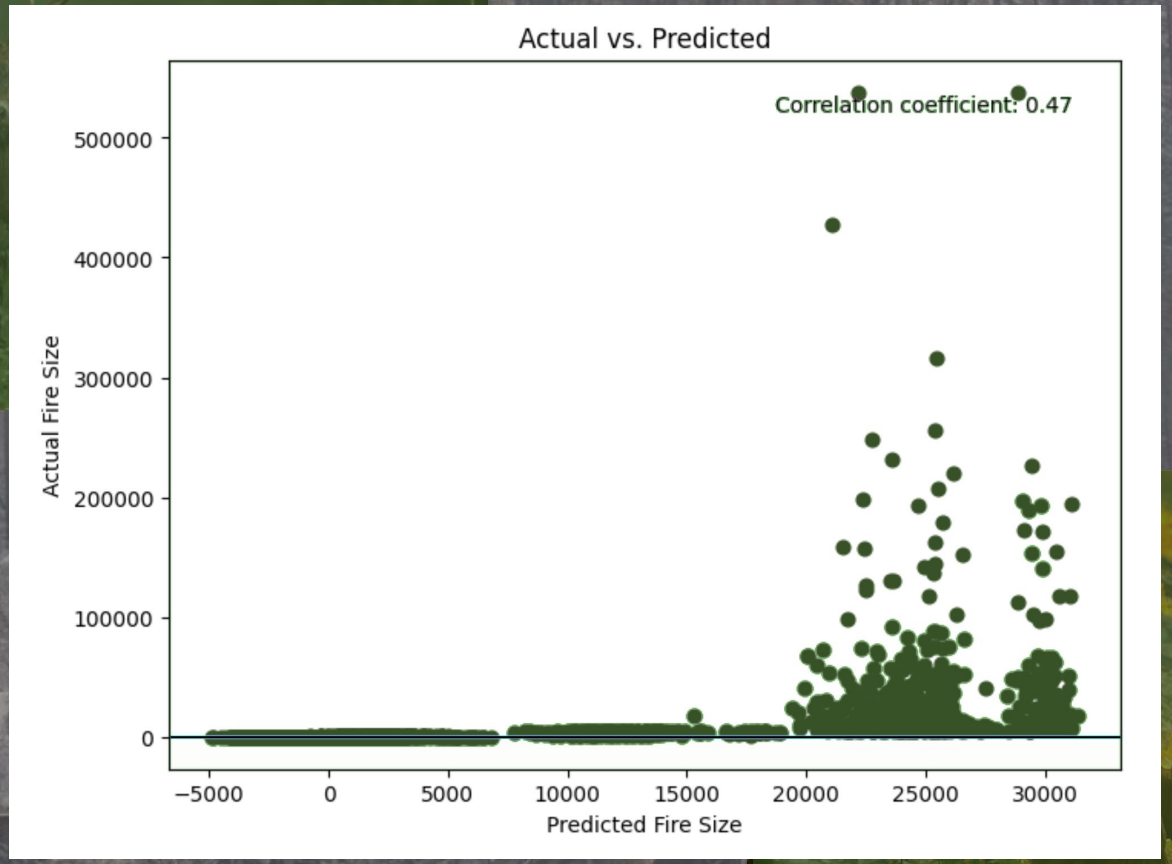
MACHINE LEARNING MODEL

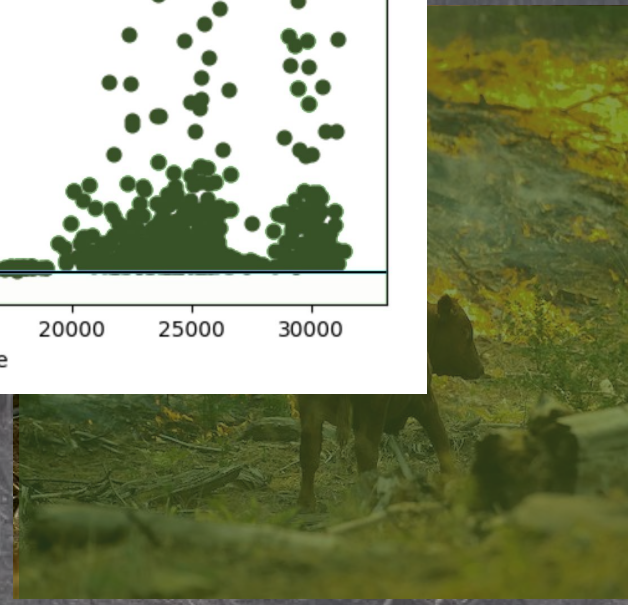
MULTIPLE LINEAR REGRESSION

MSE: 132725019.786
MAE: 2777.44829

Accuracy: 8.08%

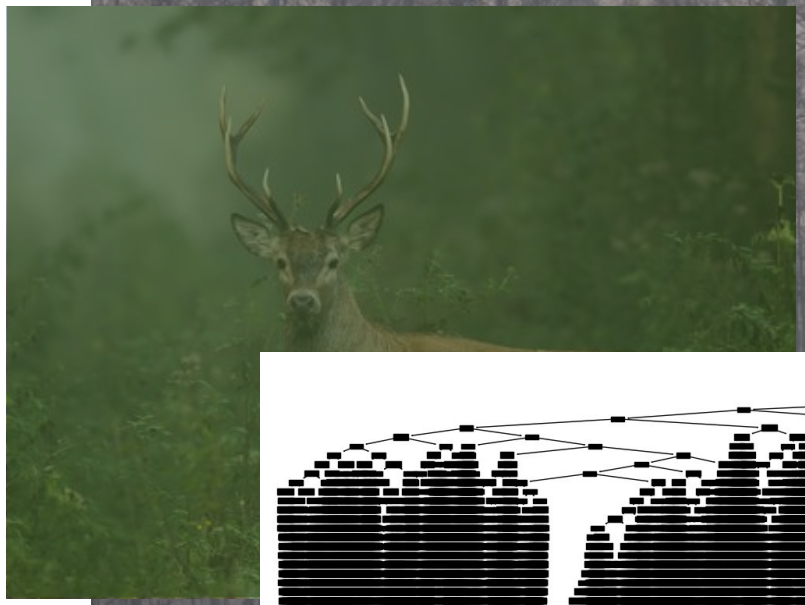


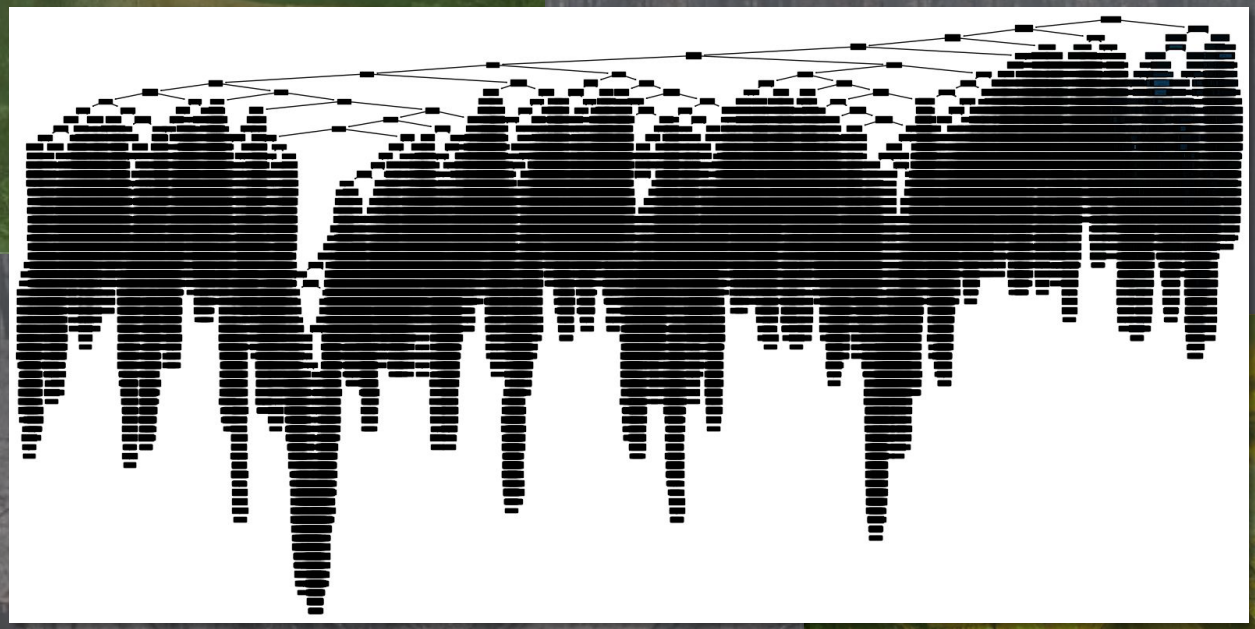


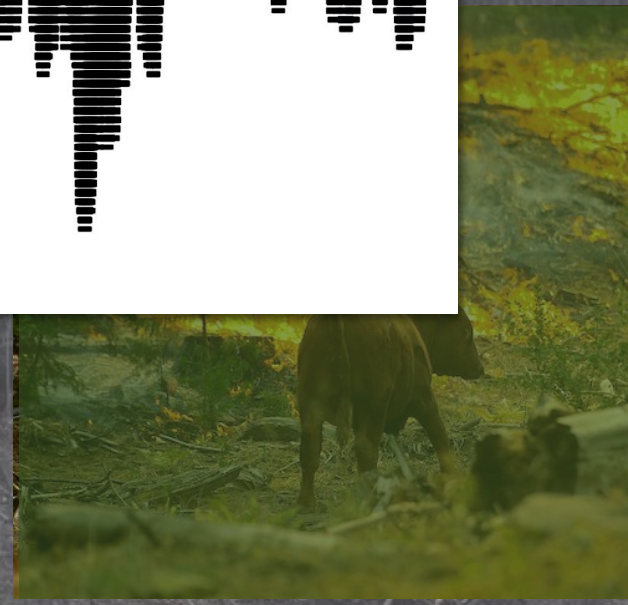


DESCISION TREE

Accuracy: 93.44%

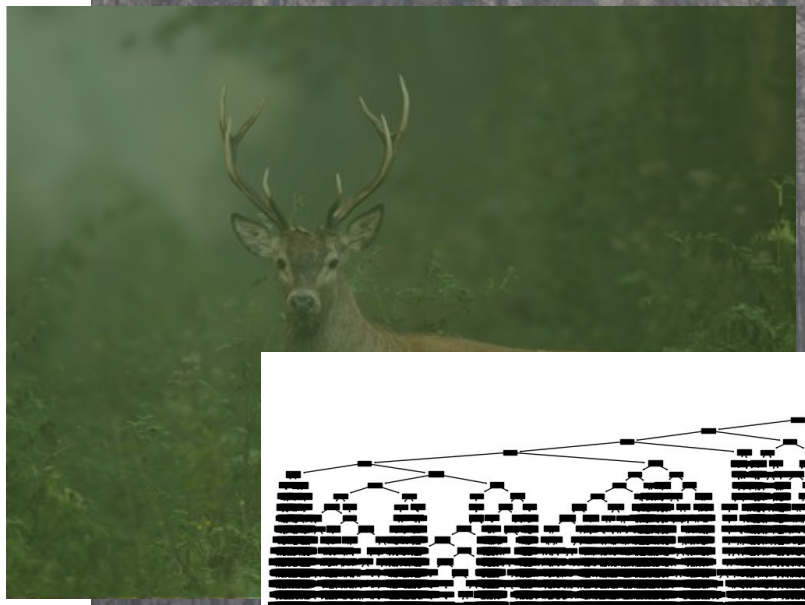


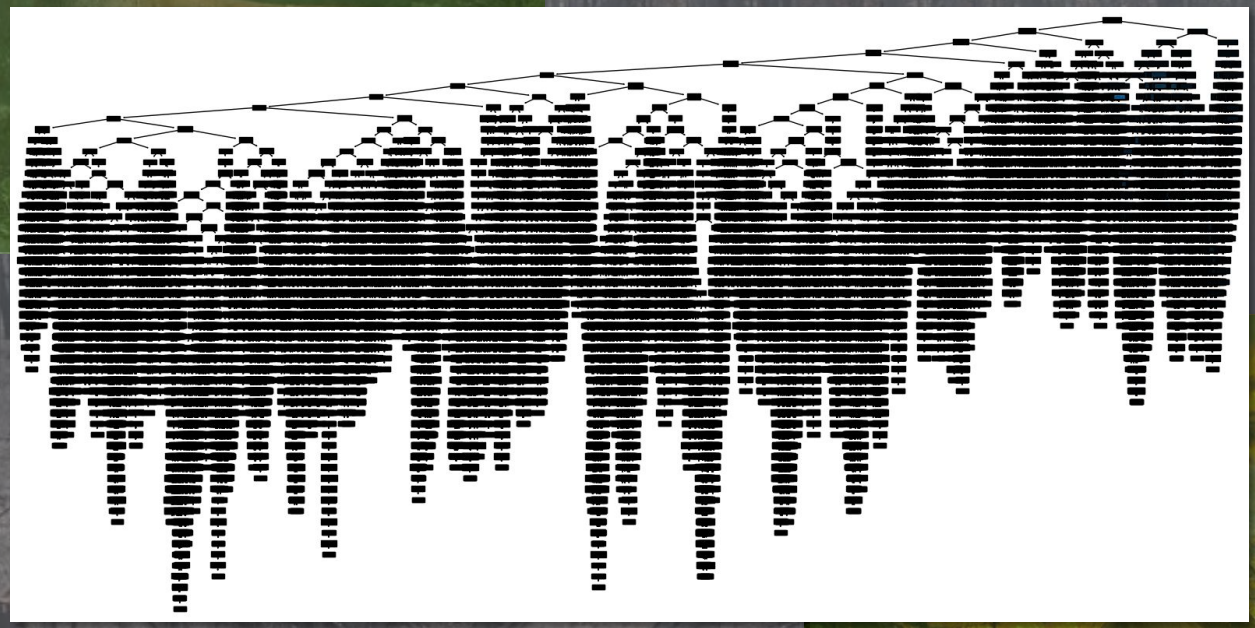


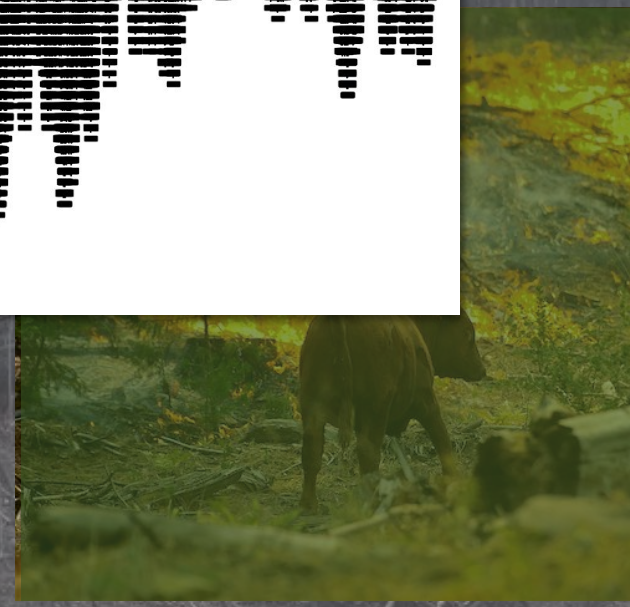


RANDOM FOREST

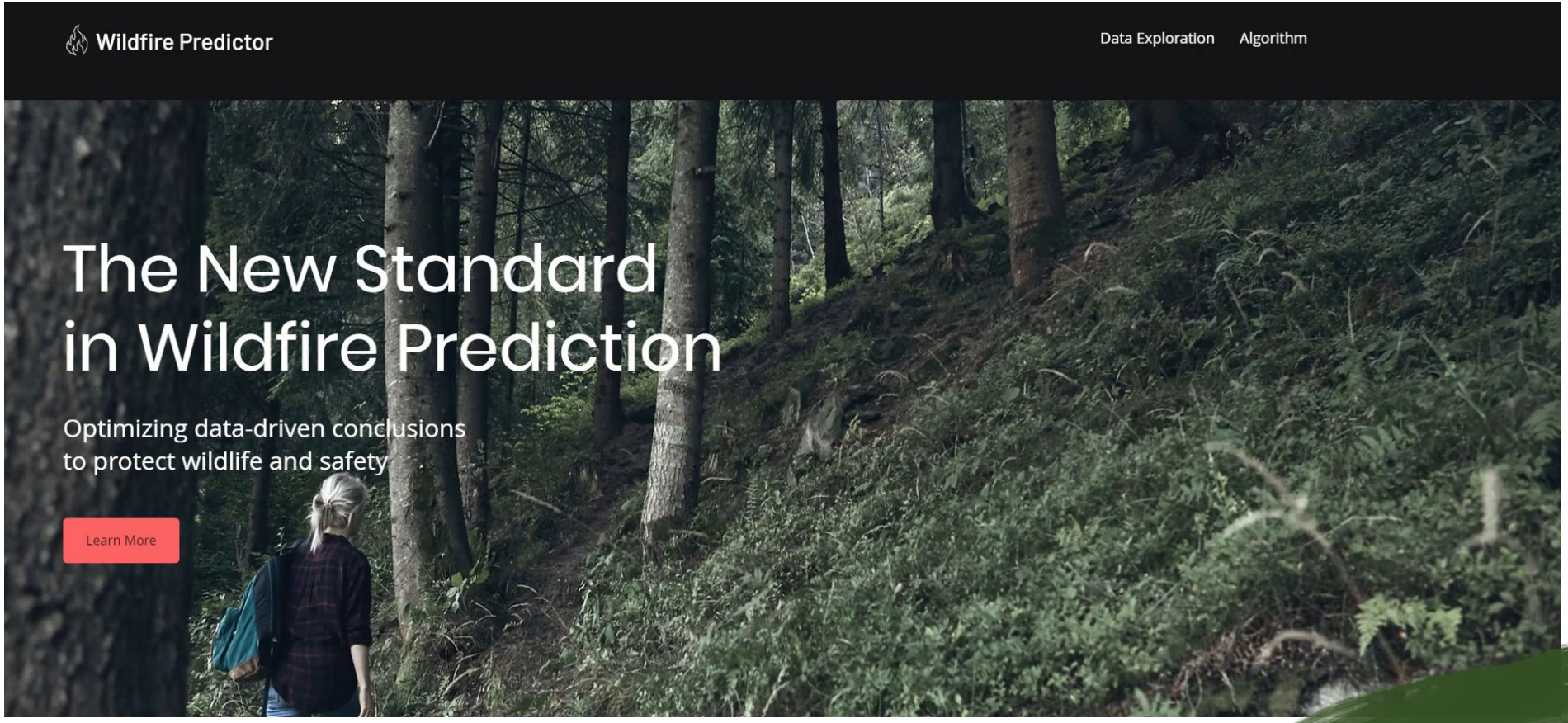
Accuracy: 96.16%







WEBSITE


Wildfire Predictor
Data Exploration
Algorithm
The New Standard
in Wildfire Prediction
Optimizing data-driven conclusions
to protect wildlife and safety
Learn More

NEXT STEPS

Implement a real-time Wildfire predictor and improve our current predictor with ensemble learning

LIMITATIONS

Human behavior, which is responsible for 85% of wildfire causes is unpredictable

IMPACT


THANK YOU

BIBLIOGRAPHY

In addition to the sources provided to us specifically for this competition, the following resources were used:

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