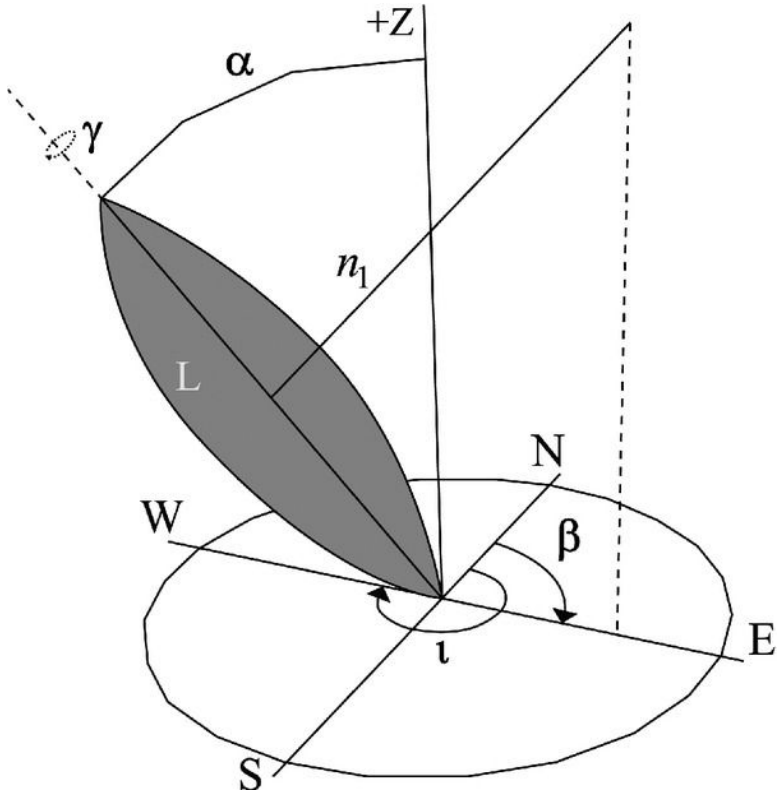
Data Analysis of Impulse Response from Leaves

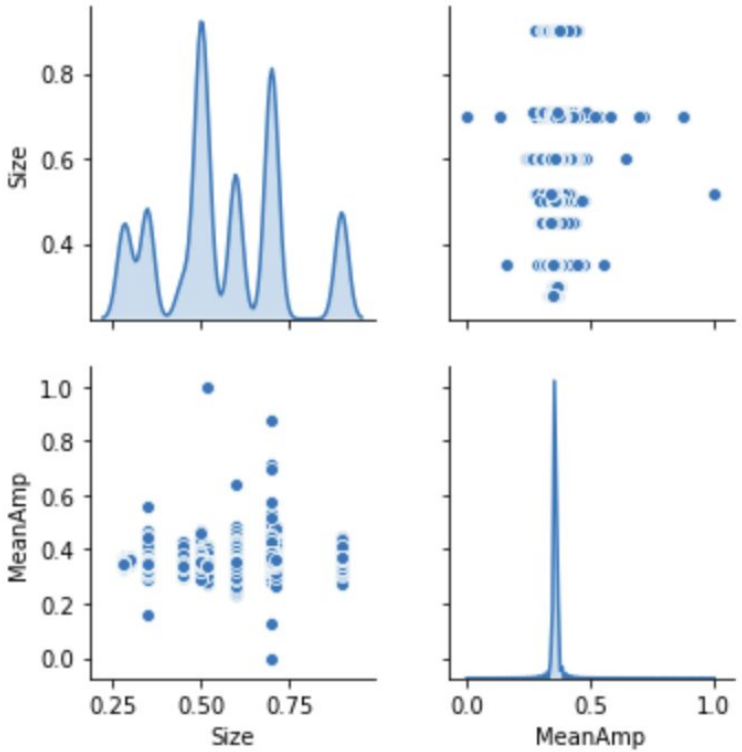
By Sefunmi Ashiru

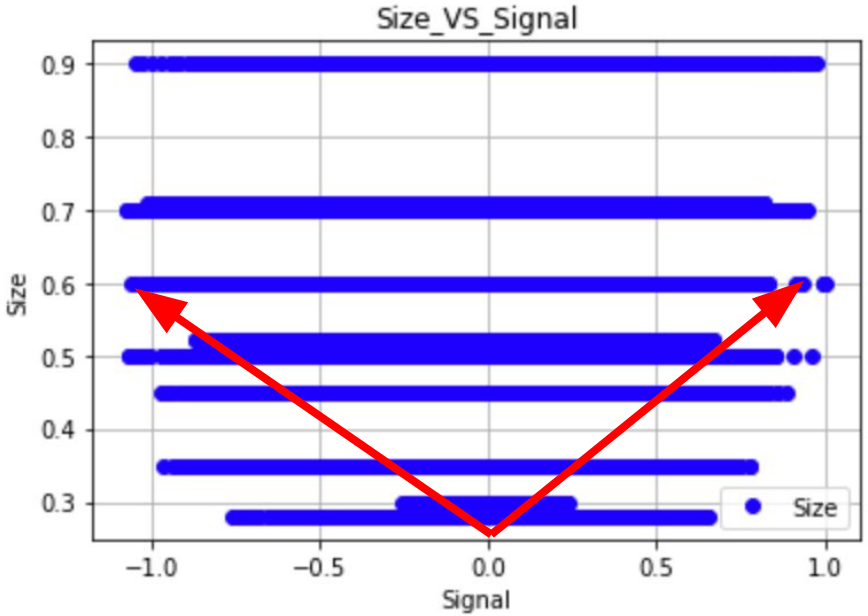
Task & Goals

- Analyze dataset of Impulse Responses (IR) of leaves
- Find relationship between IR and leaf characteristics:
  - Elevation Angle
  - Azimuth Angle
  - Size
- See weather any of the characteristics can be predicted

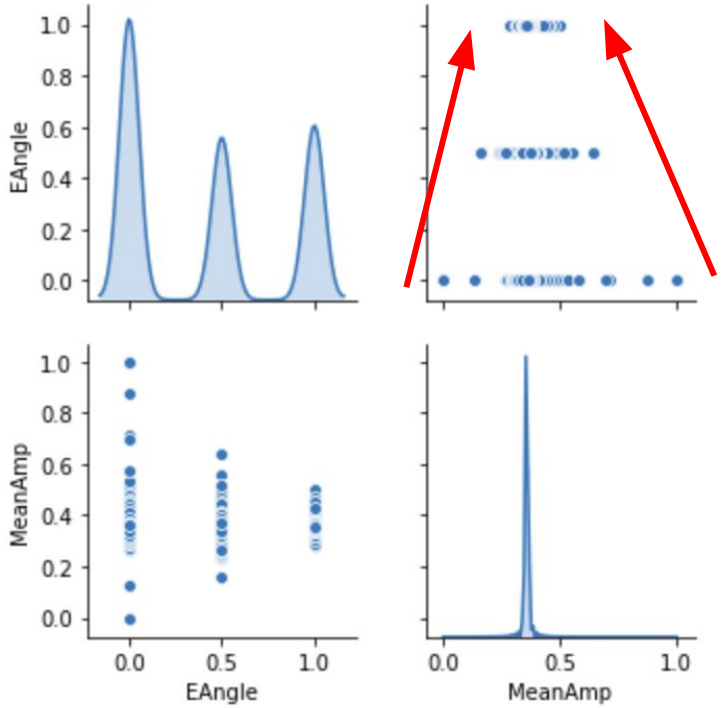


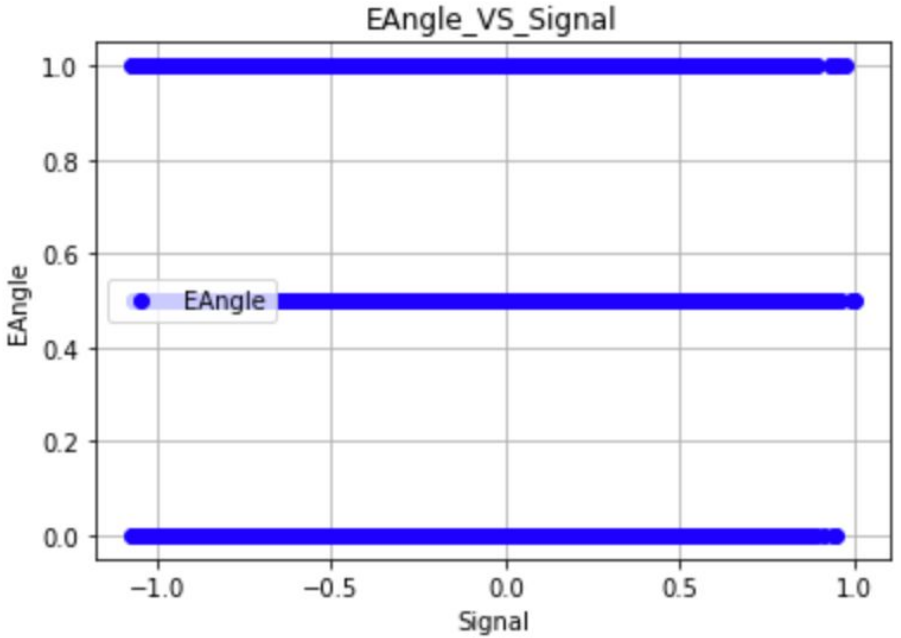
Size VS Impulse Response



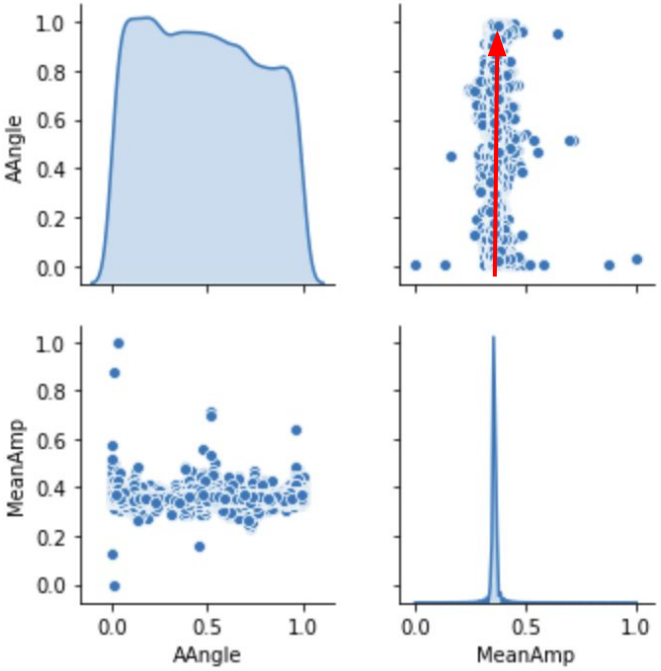


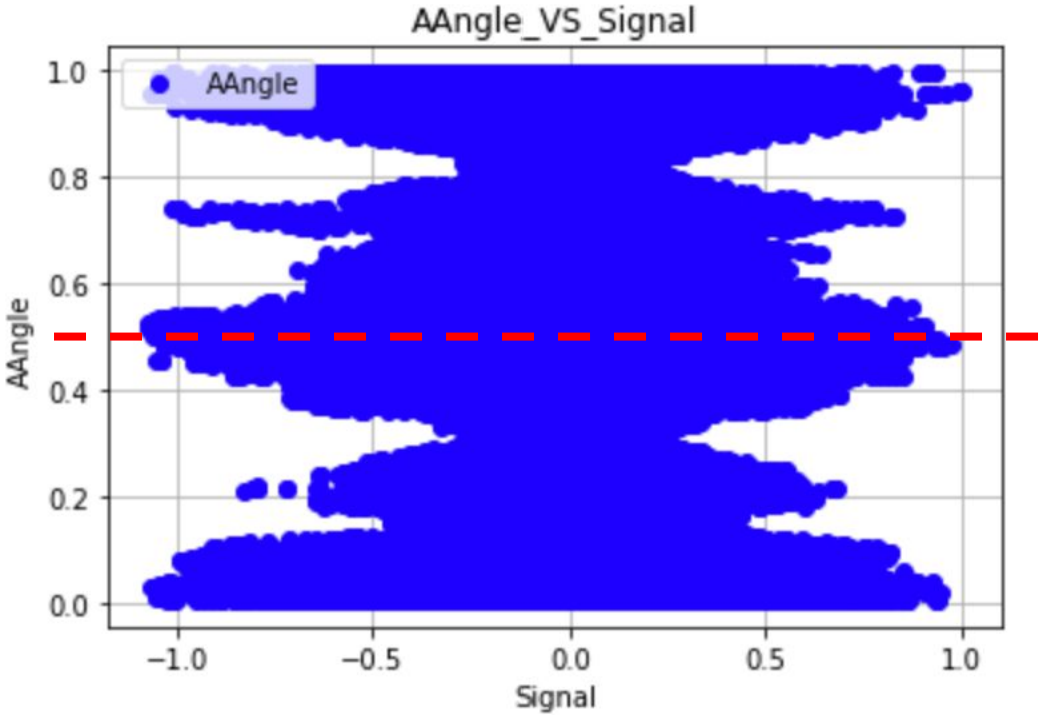
Elevation Angle VS Impulse Response





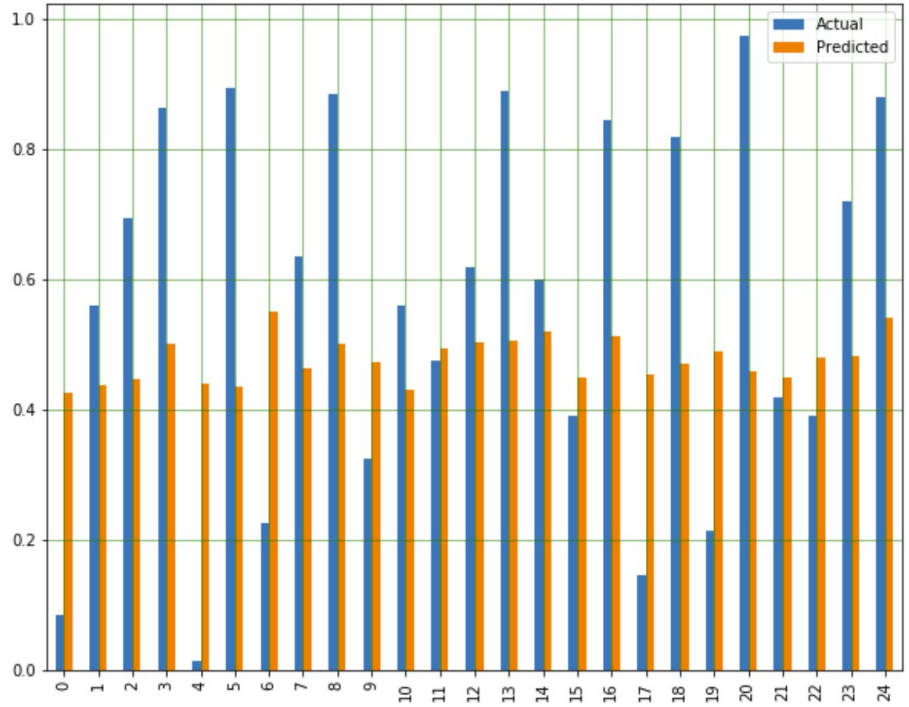
Azimuth Angle VS Impulse Response





L.R. Predictions for Azimuth Angle

	Actual	Predicted
0	0.085	0.425573
1	0.560	0.438710
2	0.695	0.446436
3	0.865	0.500572
4	0.015	0.440175
5	0.895	0.434970
6	0.225	0.550464
7	0.635	0.464754
8	0.885	0.501133
9	0.325	0.472724
10	0.560	0.430341
11	0.475	0.493595
12	0.620	0.503928
13	0.890	0.507136
14	0.600	0.521393
15	0.390	0.449466
16	0.845	0.512859
17	0.145	0.453927
18	0.820	0.471031
19	0.215	0.490338
20	0.975	0.458970
21	0.420	0.448971
22	0.390	0.480626
23	0.720	0.483008
24	0.880	0.541760

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Mean Absolute Error: 0.2473782703865056
Mean Squared Error: 0.08149574567819494
Root Mean Squared Error: 0.2854745972555088
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Citations

- Shanmugam, A. (2020). *Simple Linear Regression with example using NumPy*. Medium. Retrieved 17 April 2020, from https://medium.com/analytics-vidhya/simple-linear-regression-with-example-using-numpy-e7b984f0d15e.

- Singh Chauhan, N. (2020). *A beginner's guide to Linear Regression in Python with Scikit-Learn*. Towards Data Science. Retrieved 17 April 2020, from https://towardsdatascience.com/a-beginners-guide-to-linear-regression-in-python-with-scikit-learn-83a8f7ae2b4f.