Research Experience for Teachers (RET) Summer 2020

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RESEARCH BACKGROUND/DESCRIPTION

• Similar work has been done already with applying classification algorithms to fault detection in solar systems.
• Our goal is to also apply the Positive Unlabeled algorithm to the data set as well.

RESEARCH OBJECTIVES/PLAN

• Create classification models using labeled data for solar arrays that are affected by soiling, weather, ground leakage and short circuits.
• Evaluate the models and use our assessments to create new methods that can be used for unlabeled solar array data sets.

RESEARCH RESULTS/REMARKS

• The logistic regression algorithm worked best for the labeled data. Neural network showed good results but was unstable.
• The modified logistic regression (PU) model performed very well with unlabeled data.

LESSON PLAN OBJECTIVES

Students will:
• manually develop the concept of the Kmeans algorithm
• demonstrate the use of Kmeans Python algorithm in Google Colab
• apply Kmeans algorithm to choosing an optimal location for a business and provide a report

LESSON IMPLEMENTATION/OUTCOMES

• Explain the math behind the Kmeans algorithm
• Demonstrate use of python code to run Kmeans algorithm
• Apply algorithm to solving real-world questions
• Communicate results in technical report

REFERENCES

[3] Fault Classification in Photovoltaic Arrays via Graph Signal Processing Jie Fany, Sunil Raoy, Gowtham Munirajuy, Cihan Tepedelenlioglu and Andreas Spanias SenSIP Center, School of ECEE, Arizona State University

SensSignal and Information Processing Center https://sensip.asu.edu

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