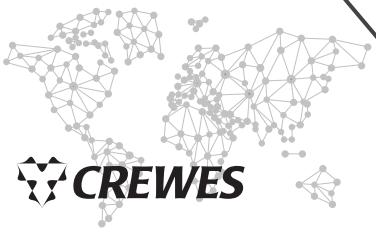


USING HYBRID MACHINE LEARNING MODELS

Marcelo Guarido

Daniel Trad

David Emery



HOSTS



Marcelo Guarido

Data Scientist with PhD in Geophysics Head of the CREWES Data Science Initiative.



Daniel Trad

Associate Professor and Chair in Exploration Geophysics at University of Calgary.

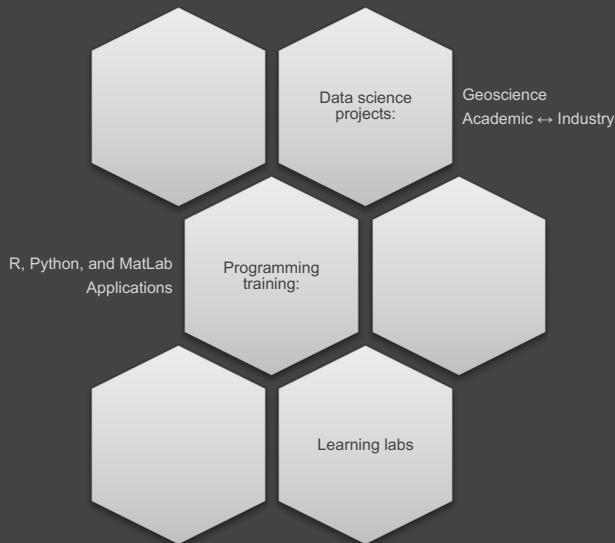


David Emery

Geophysical specialist and active member of the CREWES Data Science Initiative



CREWES Data Science Initiative



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Data Science

Data Science is a growing field with different tasks and applications. Everyday more students are choosing to take a career course and moving to this relatively new and exciting area. Here at the CREWES we are engaged on research and dissemination of what is new in the data science world.

With the CREWES Data Science Learning Labs, we focus on the learning steps to bring business value to your organization. The labs will focus on how a data scientist goes about solving a problem, from reading in data, through data cleaning and pre-processing, visualization, data transformation, machine learning, and finally finishing with app development/deployment. Join us for bi-weekly webinars beginning July 2nd (with more to be announced) to get access to codes and "cookbooks."

Lab 0: July 2, 2020, Noon (MST): Introduction to R and Shiny

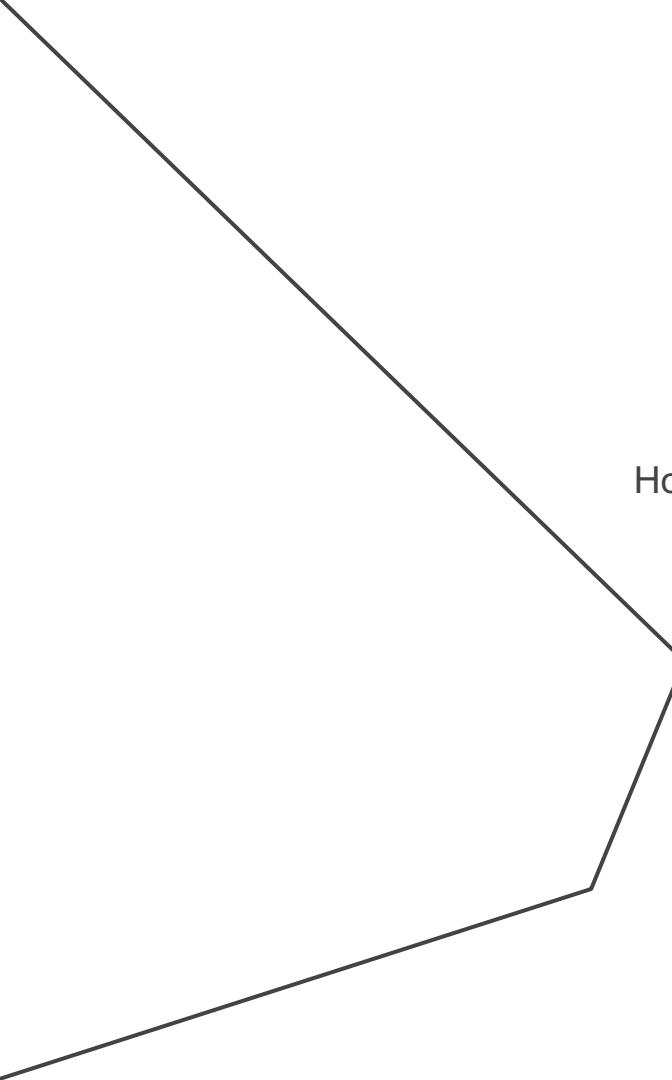
In our first lab we will set out our goals, define a learning path, and introduce both building of apps with the Shiny library.

[Data Science Lab 0 \(video\)](#)

Lab 1: July 16, 2020, Noon (MST): WTI crude oil price forecasting algorithm

In this lab, we will present a workflow in R to predict the WTI crude oil price that includes reading in data from the Quandl database, as well as the univariate forecast algorithm Facebook Prophet. We will also demonstrate a demonstration of an app built in Shiny.

[Register for the live Zoom presentation](#)



PAPER OVERVIEW

Presenting the proposed solution

HYBRID MODELS

How to create a hybrid model using the package
mlxtend

REGRESSION

Coding: how to stack regression models

CLASSIFICATION

Coding: ensemble voting system for trained
classifiers

01

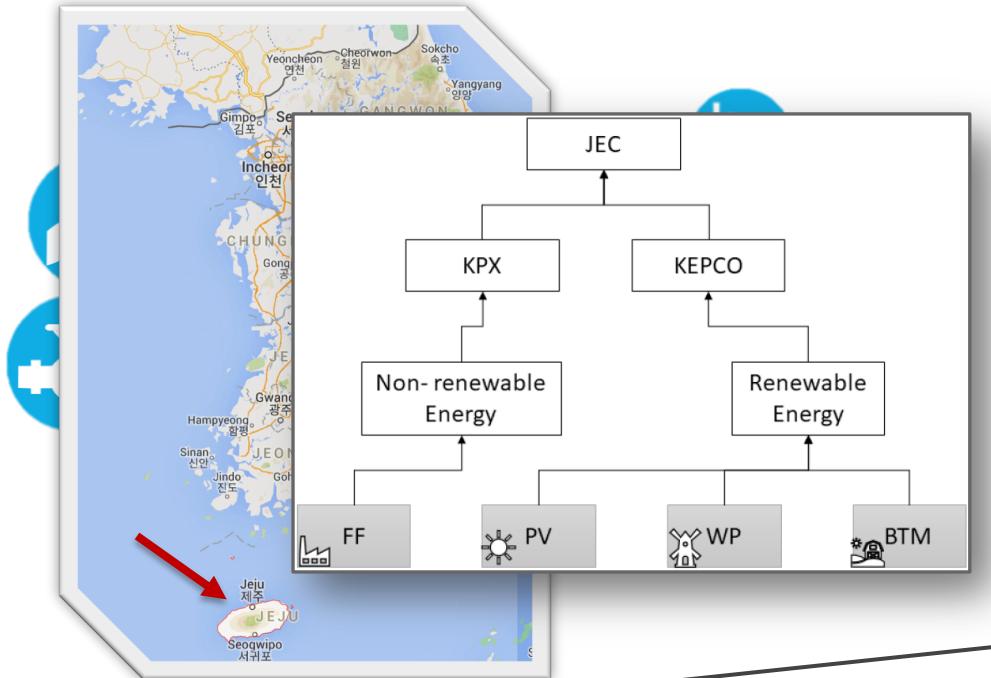
02

03

04

MACHINE LEARNING-BASED APPROACH TO PREDICT ENERGY CONSUMPTION OF RENEWABLE AND NONRENEWABLE POWER SOURCES

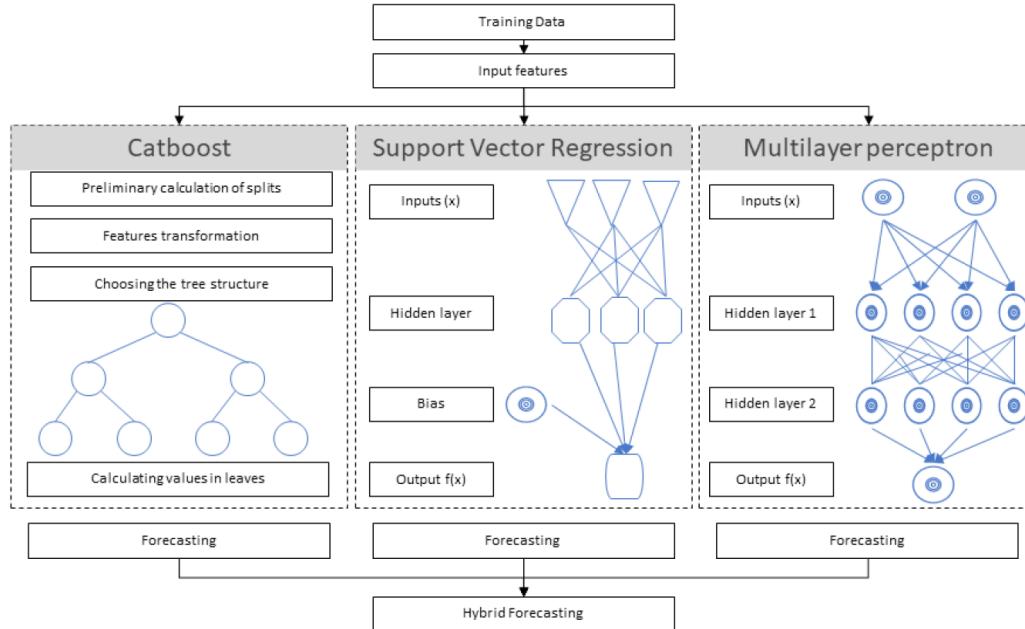
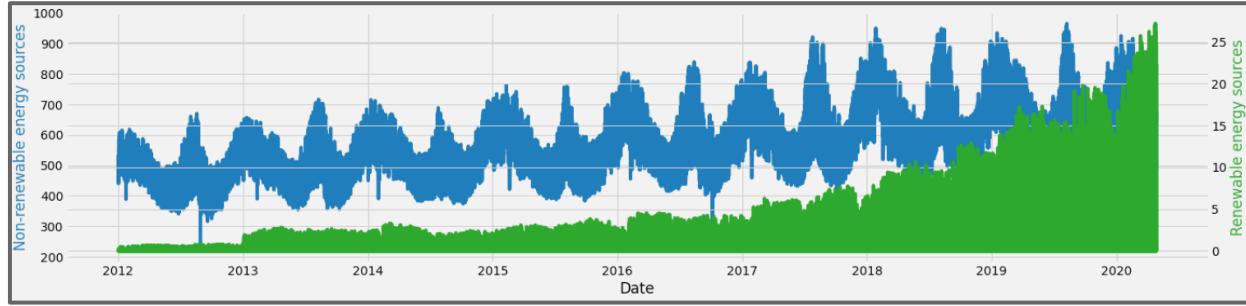
by Khan, P.W.; Byun, Y.-C.; Lee, S.-J.; Kang, D.-H.; Kang, J.-Y.; Park, H.-S, 2020



JEJU ISLAND is used as a test lab

REPLACE non-renewable energy by renewable energy by 2030

FORECAST energy consumption (MW) from all sources



ENERGY MW

Total consumption
(renewable + non-renewable)

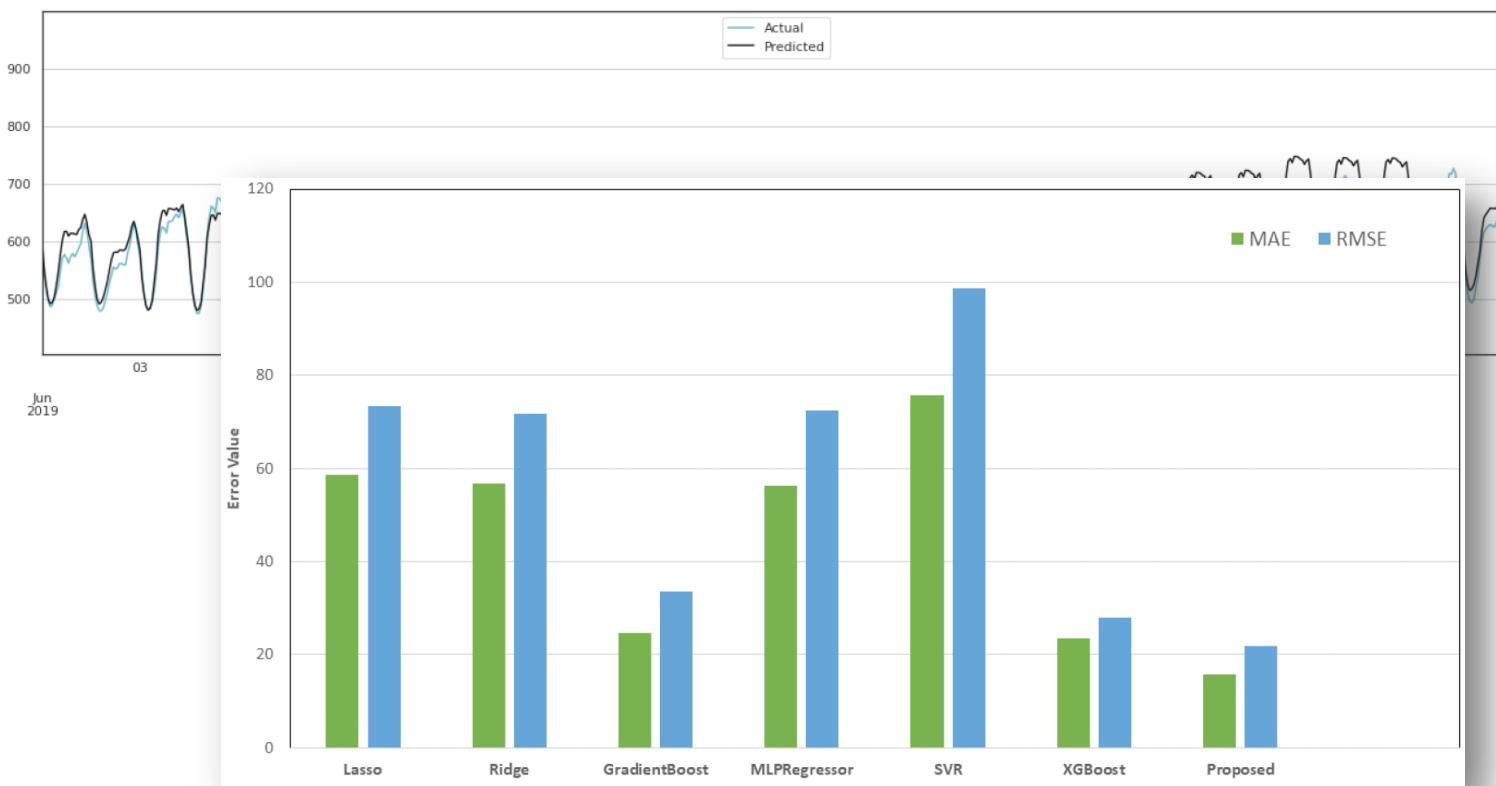
MODEL

Hybrid model

COMPARE

Against other models

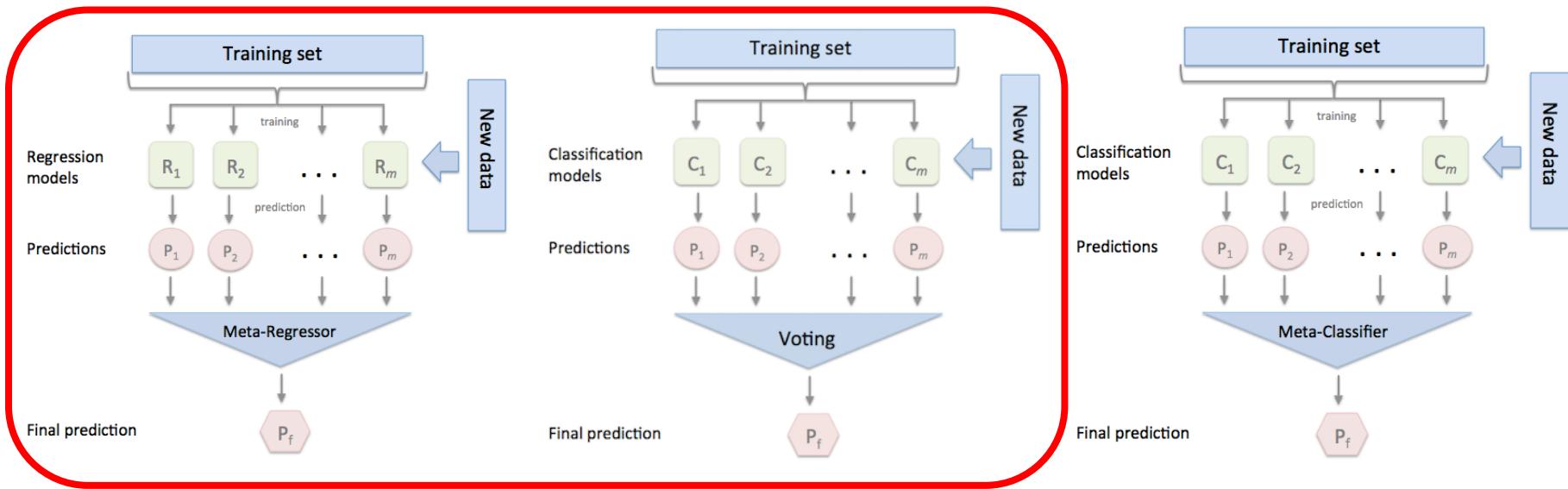
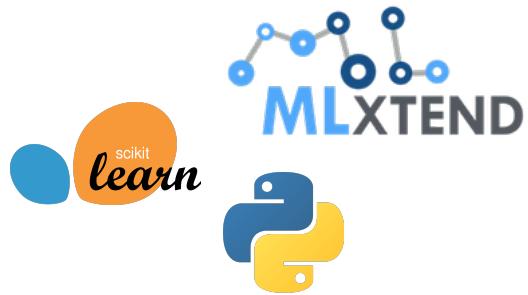
FORECASTING



RESOURCE

- Khan, P.W.; Byun, Y.-C.; Lee, S.-J.; Kang, D.-H.; Kang, J.-Y.; Park, H.-S. Machine Learning-based Approach To Predict Energy Consumption Of Renewable And Nonrenewable Power Sources. *Energies*, **2020**, *13*, 4870. <https://doi.org/10.3390/en13184870>

HYBRID MODELS



Let's Code!!!



Thank you!