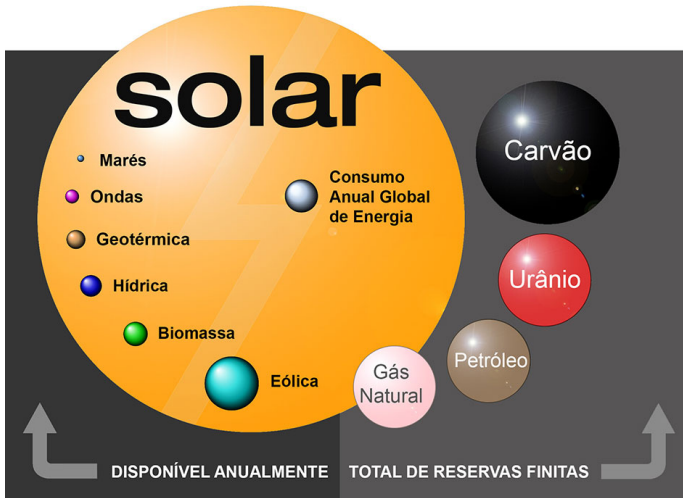


# Predição de Energia Solar com Machine Learning e IoT

Aluno: Guttardo Néri Pereira  
Orientador: Ricardo Santos Ferreira

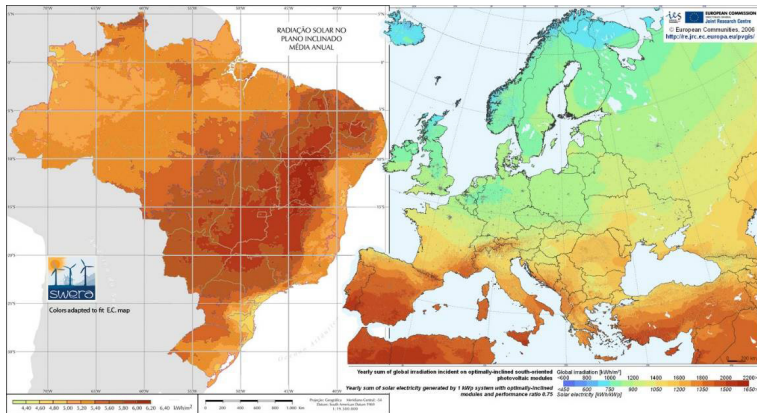
18 de Abril de 2018

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Fonte: LabSol

# Por que a energia solar?



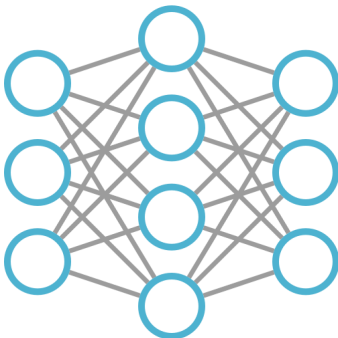
Fonte: LabSol

# Projeto no DEL-UFV



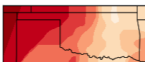
- Ideia inicial era utilizar de sensores LDR para estimar a irradiação solar

# Machine Learning e IoT



- Pesquisas passadas em IA
- Interesse pessoal em microcontroladores e na vasta gama de possibilidades envolvendo IoT

# Competição Internacional



## AMS 2013-2014 Solar Energy Prediction Contest

Forecast daily solar energy with an ensemble of weather models

\$1,000 · 160 teams · 4 years ago

[Overview](#) [Data](#) [Discussion](#) [Leaderboard](#) [Rules](#)

### Overview

#### Description

#### Evaluation

#### Prizes

#### Timeline

#### Winners

Welcome to the American Meteorological Society 2013-2014 Solar Energy Prediction Contest! This contest is organized by the American Meteorological Society Committees on Artificial Intelligence Applications to Environmental Science, Probability and Statistics, and Earth and Energy. Prizes are sponsored by EarthRisk Technologies, Inc.

### Motivation

Renewable energy sources, such as solar and wind, offer many environmental advantages over fossil fuels for electricity generation, but the energy produced by them fluctuates with changing weather conditions. Electric utility companies need accurate forecasts of energy production in order to have the right balance of renewable and fossil fuels available. Errors in the forecast could lead to large expenses for the utility from excess fuel consumption or emergency purchases of electricity from neighboring utilities. Power forecasts typically are derived from numerical weather prediction models, but statistical and machine learning techniques are increasingly being used in conjunction with the numerical models to produce more accurate forecasts.

Fonte: <https://www.kaggle.com/c/ams-2014-solar-energy-prediction-contest> (Acesso em 15/04/2018)

# Métodos e Objetivos

- Coletar e persistir dados de sensores de temperatura, umidade e iluminação, todos de baixo custo;
- Coletar informações meteorológicas através de APIs, com intervalo de alguns minutos/horas entre cada medição;
- Plataforma WEB para visualização de gráficos e precisão das medidas previstas pela API;
- Utilizando os dados coletados, prever a quantidade de energia solar disponível na estação para intervalos de 10 ou mais dias.

# Cronograma

	MARÇO	ABRIL	MAIO	JUNHO	JULHO
Definição do Tema	X				
Estudo de Machine Learning	X	X	X	X	X
Preparação de Material		X			
Plataforma WEB		X	X		
Leitura de Dados dos Sensores			X	X	X



# Referências



E. Alpaydın. Introduction to Machine Learning. 2.ed. Massachusetts, EUA: MIT Press, 2009.



E. F. A. Fadigas. Disponível em:  
<[https://edisciplinas.usp.br/pluginfile.php/56337/mod\\_resource/content/2/Apostila\\_solar.pdf](https://edisciplinas.usp.br/pluginfile.php/56337/mod_resource/content/2/Apostila_solar.pdf)>.



S. Raschka. Python Machine Learning. 1.ed. Birmingham, Reino Unido: Packt, 2015.

# DÚVIDAS? SUGESTÕES?

Site do Projeto: <https://github.com/Guttardo/guttardoTCC>