WELCOME STUDENTS !!!!!

Master of Environmental Management Program
Nicholas School of the Environment - Duke University

ENV790.30 – TIME SERIES ANALYSIS FOR ENERGY DATA

M1: Course Overview and Introductions

Luana Lima

Master of Environmental Management Program
Nicholas School of the Environment - Duke University

Agenda

- Instructor and TAs Introduction

- Students Introduction

- Syllabus/Website

  - Proposed Class Schedule

  - Course Format and Grading

  - Resources

Instructor Introduction

Luana Lima

A Little About Myself

☐ Born in Rio de Janeiro, Brazil

☐ Lived most of life in Itajubá, MG

☐ Anderson de Queiroz a professor at NCCU|NCSU

☐ We have two teaching assistants: Clara (10 yrs) and Lucas (6 yrs)

And before you ask…

Yes! We love soccer…

My Education

- **Bachelor of Science, Electrical Engineering**

  FEDERAL UNIVERSITY OF ITAJUBÁ, Brazil, 2005

  Electrical Power Systems

- **Master of Science, Electrical Engineering**

  FEDERAL UNIVERSITY OF ITAJUBÁ, Brazil, 2007

  Invested Cost Related Price for Transmission Use: Drawbacks and Improvements in Brazil

- **Ph.D., Operations Research and Industrial Engineering**

  UNIVERSITY OF TEXAS, Austin, TX, 2011

  Modeling and Forecast of Brazilian Reservoir Inflows via Dynamic Linear Models under Climate Change Scenarios

My Work Experience

- Marangon Consulting and Engineering
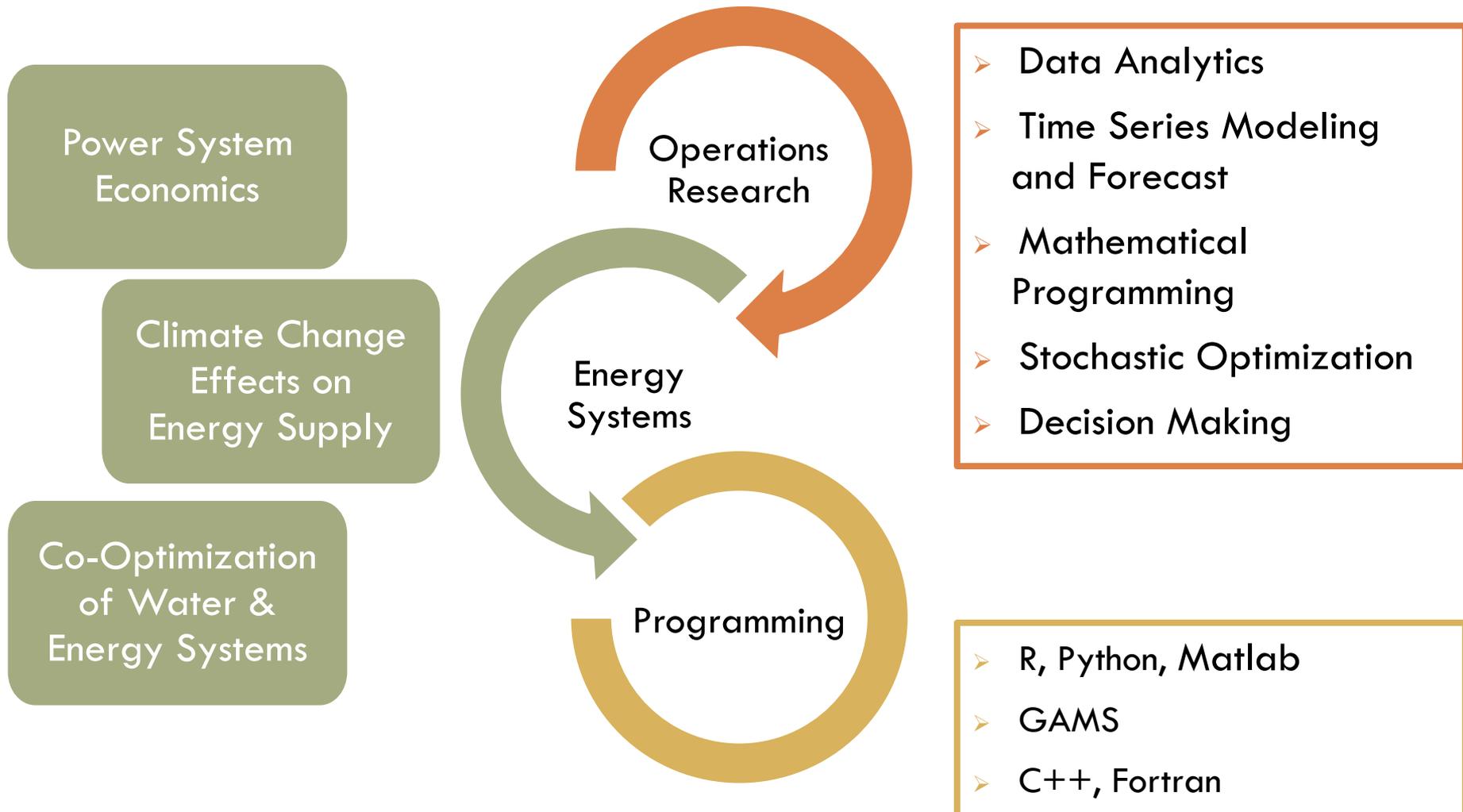
  2006-Present

  ASSOCIATE RESEARCHER

- Federal University of Itajubá

  Institute of Electrical And Energy Systems

  2013-2016

  ASSISTANT PROFESSOR

  SYSTEMS ENGINEERING RESEARCH GROUP LEADER (2014-2015)

- Duke University since 2018

  VISITING ASSISTANT PROFESSOR AT NICHOLAS SCHOOL OF THE ENVIRONMENT

  ASSOCIATE DIRECTOR FOR EDUCATIONAL PROGRAMS AT THE ENERGY INITIATIVE

  DIRECTOR OF ENERGY STUDIES AT PRATT SCHOOL OF ENGINEERING

My Teaching & Research Experience

Power System Economics

Climate Change Effects on Energy Supply

Co-Optimization of Water & Energy Systems

Operations Research

Energy Systems

Programming

- Data Analytics
- Time Series Modeling and Forecast
- Mathematical Programming
- Stochastic Optimization
- Decision Making

- R, Python, Matlab
- GAMS
- C++, Fortran

TA Introduction

Yu Hai

Students Introduction

Finish one of these sentences

- If I could change one thing in the world, I would …
- If I could learn any skill it would be…
- A funny memory from my childhood…
- The best movie of all time is…
- I work best when…
- I wish I had…

Course Overview

Let's take a look at the website...

env790.github.io

Motivation

Why should you take this course?

- How things change with time is a common form of information visualization or data analysis

- You see time series graphs nearly everyday in the newspapers or on the television news

- Statistics isn't an easy topic to understand. But a very important one.

  - It's one of the best ways to work against those biases that keep you from making good decisions.

Some thoughts from famous authors…

"The present can only be understood and the future can only be predicted in the light of the past"
Stephen Few, Book: 'Now you See it'

"We need to stop, and admit it: we have a prediction problem. We love to predict things – and we aren't very good at it."
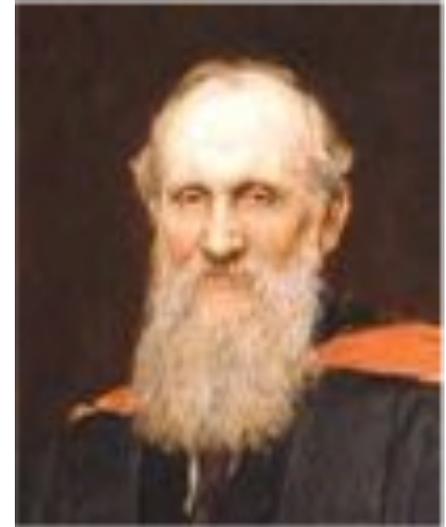Nate Silver, Book: 'The Signal and The Noise'

Why do we simulate?

- British physicist and engineer Lord Kelvin (William Thomson) once said:

  "*When you can measure what you are speaking about and express it in numbers, you know something about it.*"
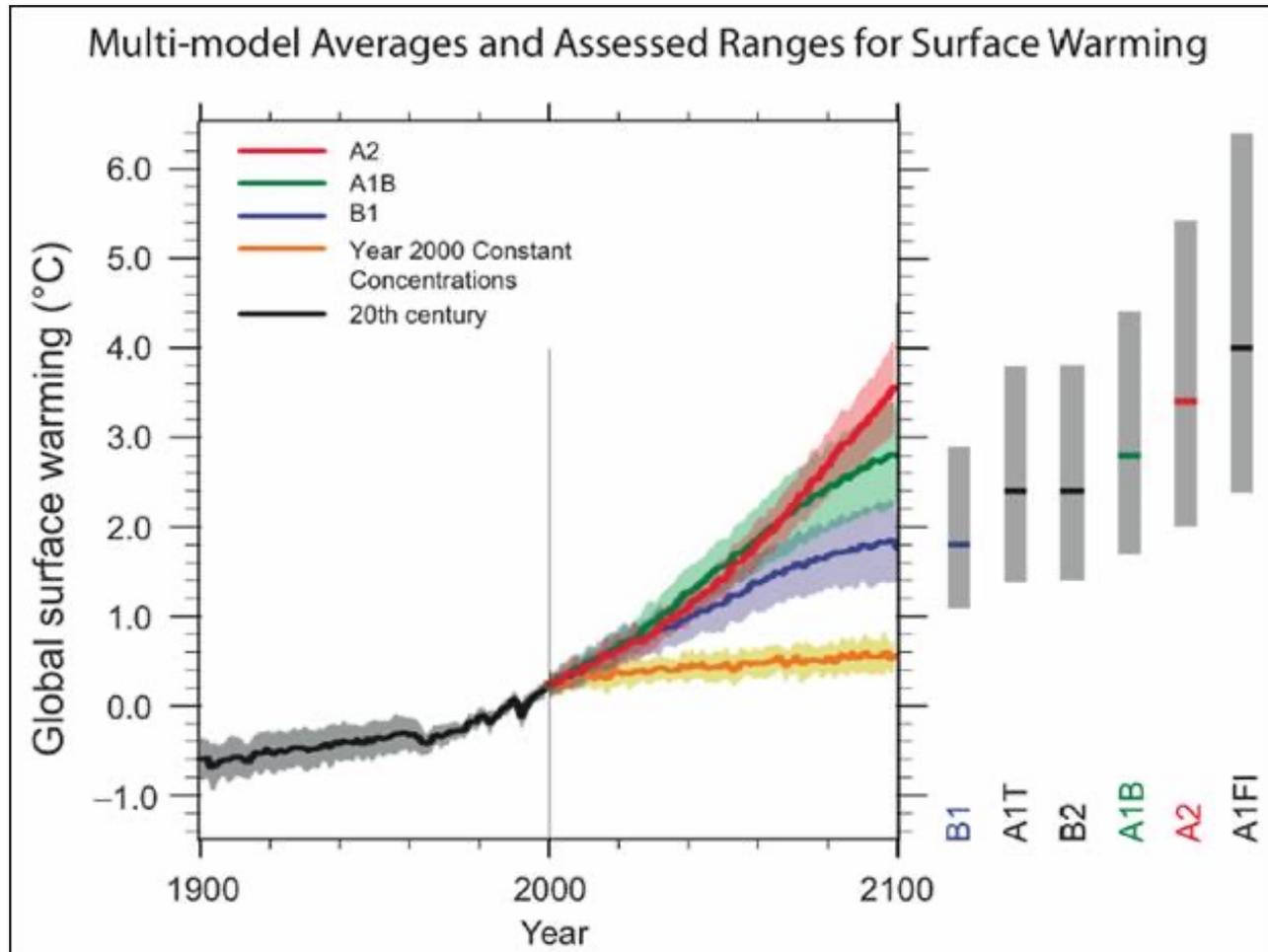

Lord Kelvin 1827-1904

- Johnny Heikell updated the thought to the computer-age

  "*When you can simulate what you are speaking about and present it visually, you know something about it.*"

Express your knowledge in the right way

Source: Intergovernmental Panel on Climate Change – AR4

THANK YOU !

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