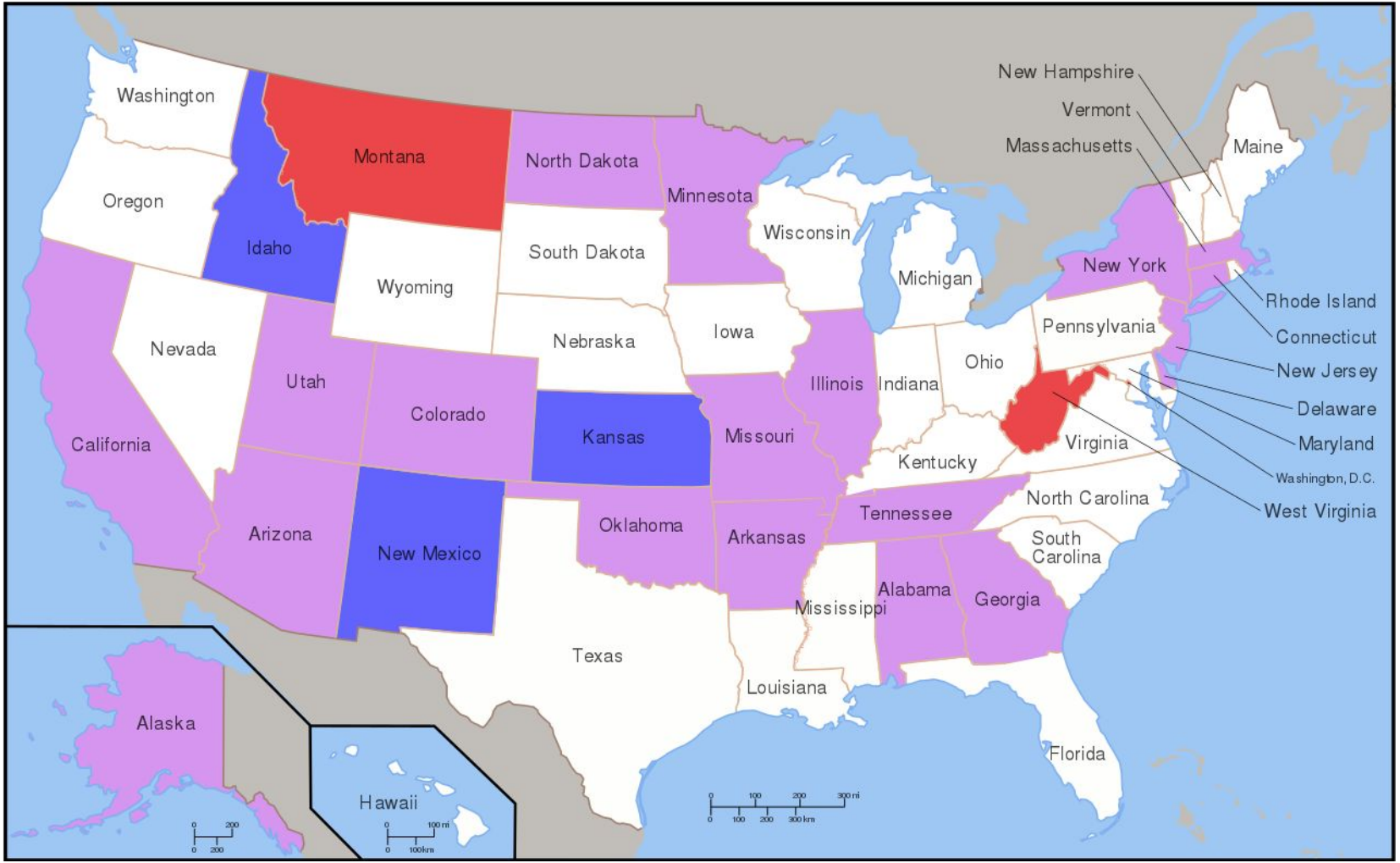
CSCI 285 Scientific Computing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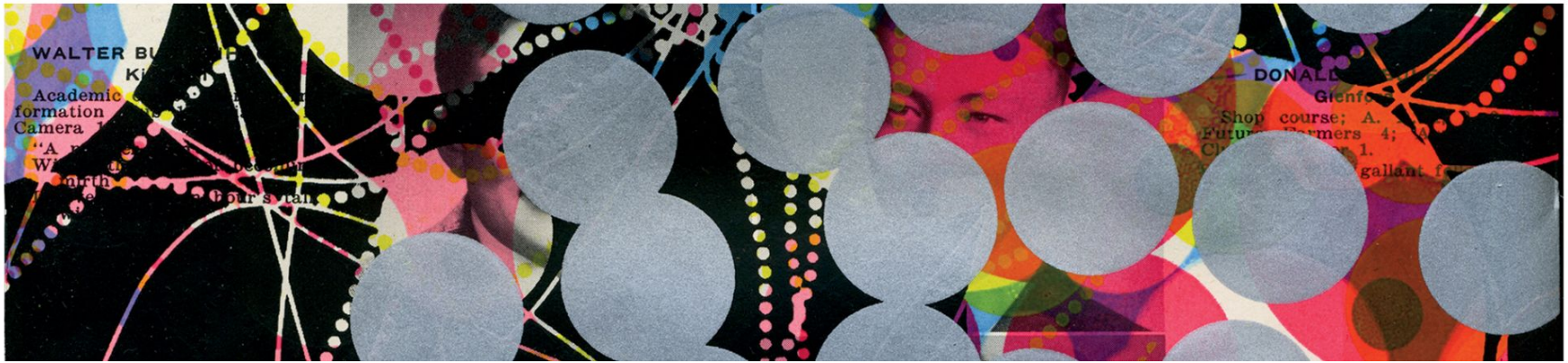
Pennsylvania
New York
Maryland
Delaware
New Jersey
Connecticut
Rhode Island
Massachusetts
Vermont
New Hampshire
Maine
Washington, D.C.
Alaska
Hawaii

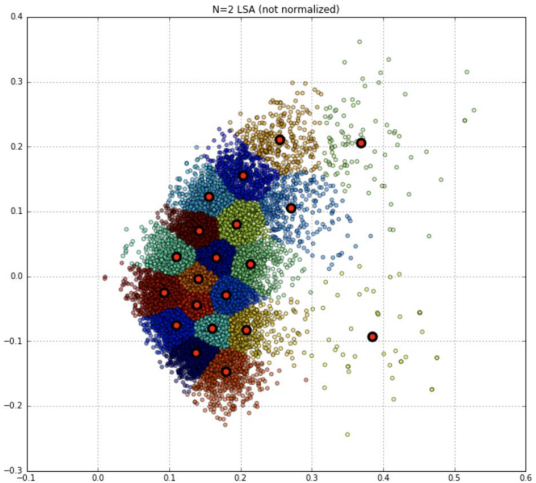
Analytics And Data Science

Data Scientist: The Sexiest Job of the 21st Century

Meet the people who can coax treasure out of messy, unstructured data. by Thomas H. Davenport and DJ Patil

From the Magazine (October 2012)





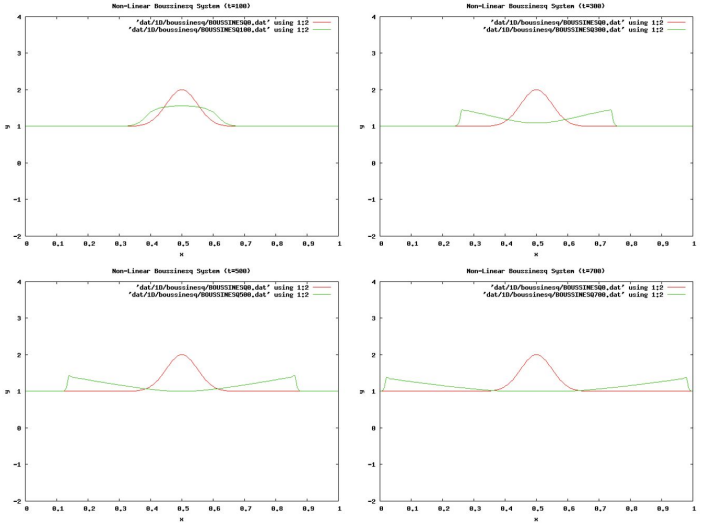
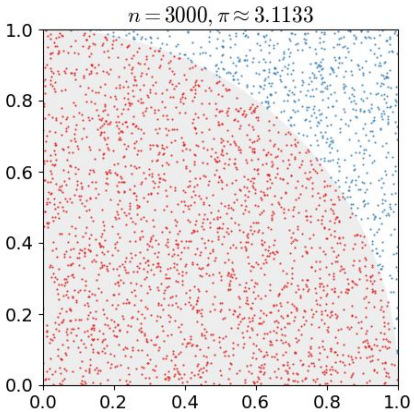
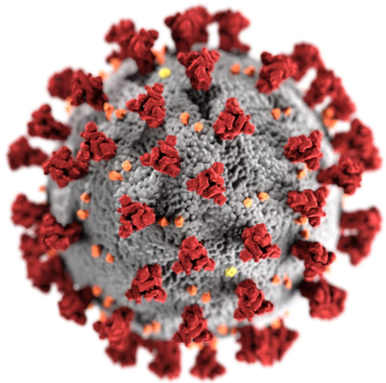


Figure 4: Initial gaussian wave with zero velocity. $\mu = 0.001$, $\varepsilon = 1$, L = 1, N = 256. cfl# = 0.1, $\sigma = 0.05$. Nonlinear shallow water.





Why did you sign up?

CSCI 285 Learning Goals

Module #1: Data Analysis

- Analyze & visualize data sets from a variety of sources.
- Learn several analysis techniques include EDA, clustering, and regression.

Module #2: Modeling

- Model and solve system dynamics problems.
- Construct a Monte-Carlo simulation model.
- Develop agent-based models for complex simulations.

Module #3: Numerical Techniques

- Approximate the roots of continuous functions.
- Understand the strengths and limitations of numerical techniques.

Write idiomatic python and use scientific python libraries.

CSCI 285 Course Overview

https://hendrix-cs.github.io/csci285/index.html

Policies
- Attendance
- Check ins / Office Hours (TBD)
- Late Work

Coursework / In-class
- Lecture (36%)
- Labs (27%)
- Exams / Module Review (20%)
- Final Project (17%)

More Info
- Course Calendar / Class Notes / Project Timeline
- W2 Requirement
- Grading scale (TBD)
- Prerequisites: MATH 130 & CSCI 150
- Teams - comms / submitting assignments

Commitments
- Active Participation
- Constructive Feedback
- Academic Integrity
- Learning Accommodation
- Physical & Mental Health

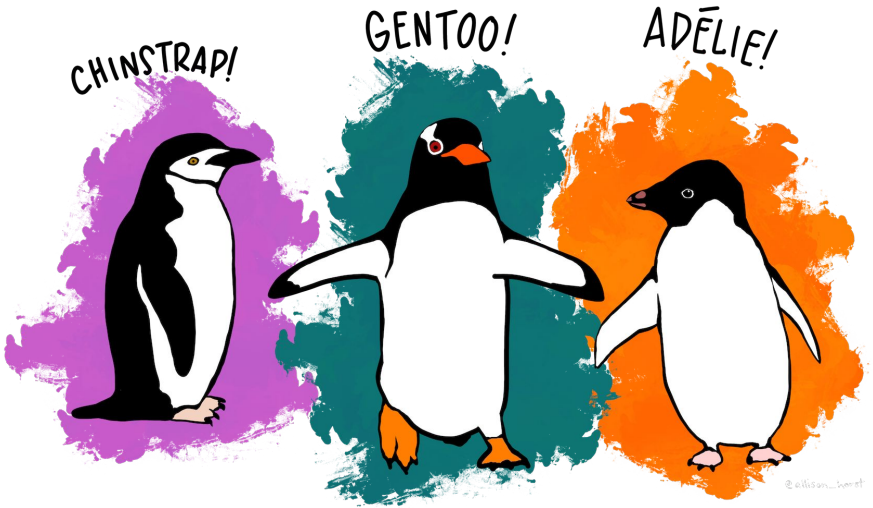
Module #1: Data Analysis

pandas is an open-source python library built for data manipulation and analysis. It is part of the standard library for many teams of data scientists and engineers. pandas introduces new types that have special syntax for data manipulation that are not shared with python's builtin types (e.g. list, dict). Some of the new syntax can look jarring at first, but is *lingua franca* for many data researchers.

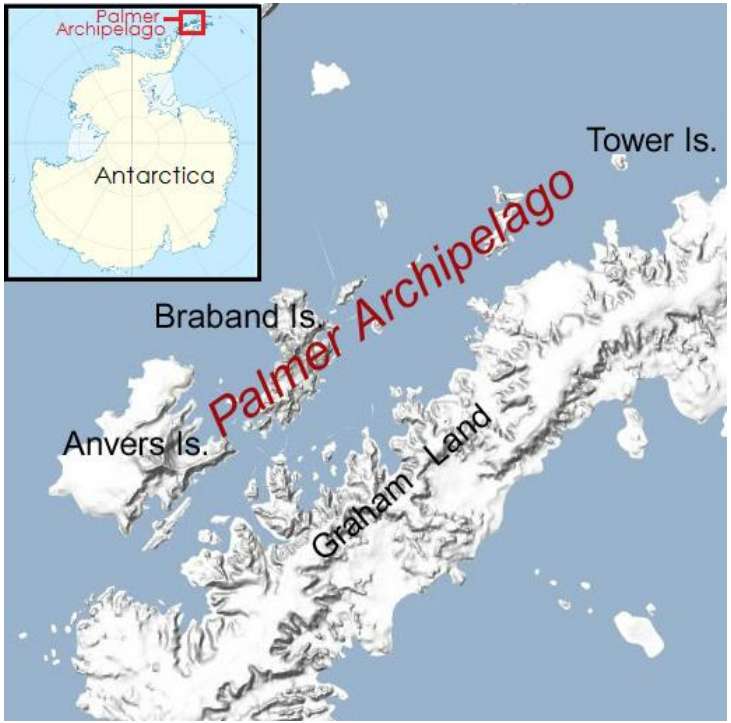
Getting Started with pandas

- https://pandas.pydata.org/pandas-docs/stable/user_guide/10min.html
- https://chrisalbon.com/
- https://www.datacamp.com/courses/data-manipulation-with-pandas

Palmer Penguins!



Artwork by @allison_horst".



Getting Started - Development Environment

1. Visit https://www.anaconda.com/
2. Download the open source distribution.
3. Follow the Anaconda3 installer instructions.
4. Launch Anaconda-Navigator (Mac, Windows, Linux)
5. Create new environments, launch processes, surf learning resources, etc.

(Alternatively, check out miniconda if you prefer a more lightweight approach)