

Course Introduction

MATH-151: Mathematical Algorithms in Matlab

August 21, 2023



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- We will use algorithms to make computers do the work for us.



MATHEMATICAL ALGORITHMS IN MATLAB

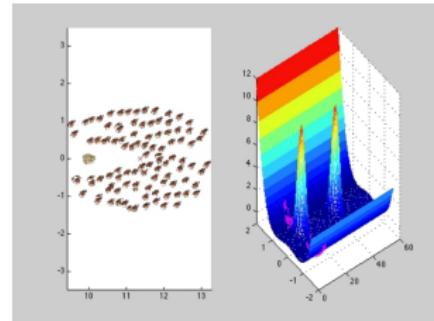
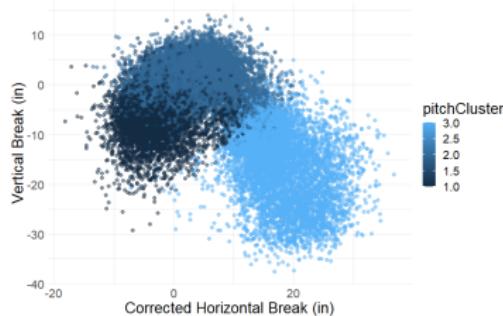
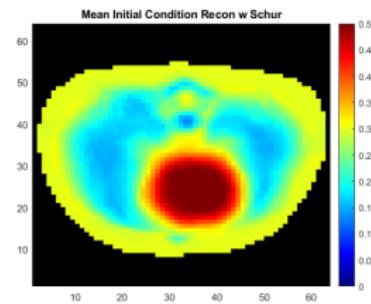
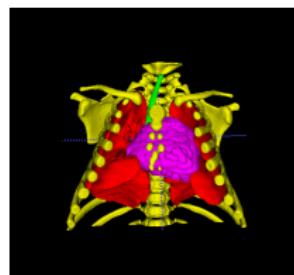
In this course students will be introduced to common algorithms used to numerically solve problems as well as learn how to implement them in the Matlab programming language.

[Click here to install Matlab](#)

Upon completion of this course, the student is expected to have the following skills:

- Ability to write and run common algorithms in Matlab, with coding familiarity transferable to other languages
- Effective code commenting and formatting, to ensure code is readable to others
- Understanding of algorithm design and how a computer “thinks”
- Debug code to identify and fix mistakes.

APPLICATIONS



WHO AM I?

- Education
 - PhD Student. Mathematics, CSU, Current
 - M.S. Applied Mathematics, UMass-Amherst, 2014
 - B.S. Applied Mathematics, RPI, 2011
- Work and Teaching
 - Previously worked as a Sr. Systems Engineer
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- Interests and Hobbies
 - Baseball
 - Tabletop and video games
 - Philosophy and pro wrestling



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- The best I can do as an instructor is to expose the class to course materials and help students gain familiarity with the topics.
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 - Working through problems.
 - Doing labs with intent. Working in groups is highly recommended.
 - Understand the purpose of each step.
 - Discussing approaches and solutions to your peers.
 - Learn from your mistakes!

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 - Learn from your mistakes!
- Don't be afraid to talk to me if you are struggling, I am very willing to help!

COURSE GRADING SCHEME

- **Lecture Journals (5%)**

- Short writing prompt assigned about each lecture
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- Cumulative lab assignment connecting various algorithms seen in class
- Lab grading will be based on the “three C’s”,
 - **Completion:** Is the lab completed?
 - **Correctness:** Does the code perform as desired?
 - **Clarity:** Is the code well presented? Is the code commented?

TENTATIVE SCHEDULE

| Dates | Monday | Wednesday | Friday |
|---------------|-------------------------------|-------------------------|---------------------|
| 8/21 - 8/25 | Course Introduction | General Coding Concepts | Matlab Introduction |
| 8/28 - 9/1 | Logic and Loops | Lab 1 | Extra Lab Time |
| 9/4 - 9/8 | No Class! | Vectors and Plotting | Lab 2 |
| 9/11 - 9/15 | Functions and Recursion | Lab 3 | Extra Lab Time |
| 9/18 - 9/22 | Interpolation | Lab 4 | Extra Lab Time |
| 9/25 - 9/29 | Numerical Integration | Lab 5 | Extra Lab Time |
| 10/2 - 10/6 | Numerical Differentiation | Lab 6 | Extra Lab Time |
| 10/9 - 10/13 | Nonlinear Solvers | Lab 7 | Extra Lab Time |
| 10/16 - 10/20 | Differential Equation Solvers | Lab 8 | Extra Lab Time |
| 10/23 - 10/27 | Final Exam | Final Exam | Final Exam |

* Schedule subject to change as necessary.