

Effective Approaches to Teaching Computation

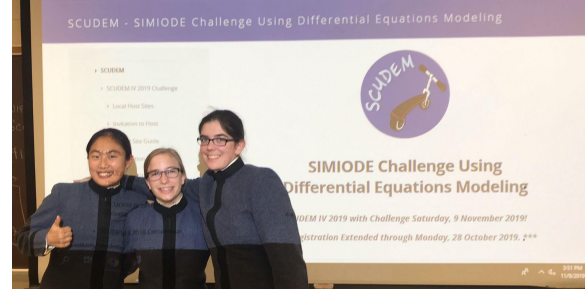
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Overview

- Classroom background
- Flipped classroom
- Tactile-Activities
- Projects

Classroom Background

- Virginia Military Institute (VMI):
 - public military institute
 - 1700 students
 - Lexington, VA.
- Applied Mathematics
 - Matlab in mathematics, engineering and physics
 - Year-long sequence
 - 20 student section



Flipped Classroom

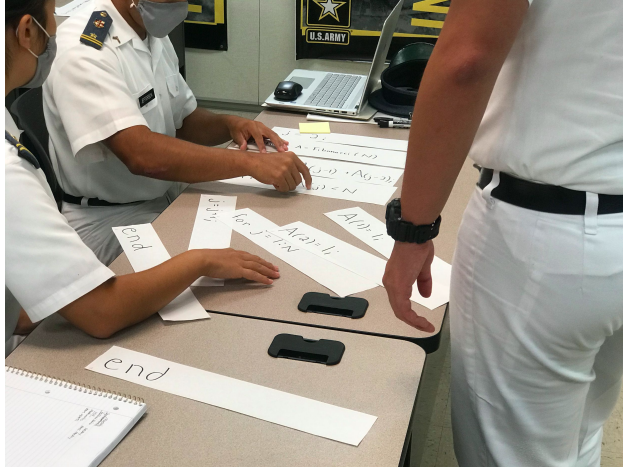
Outside of class

- Recorded video lectures and demonstrations.
- Comprehension quizzes given through LMS.

During class time

- Hands-on or tactical activities
- Programming assignments
- Larger projects

Tactile Activities



Puzzle Programing

- Students are given a task to accomplish.
- All lines of code needed are written on large paper.
- Students need to rearrange the code to accomplish the task.

Indexing the Class Matrix

- Students sit in a grid with whiteboards.
- Each student is an element of a matrix.
- Different operations are projected on the board.
- As a class, students must determine how the operation changes the matrix.

Logical Program Flow

- Code is printed out and attached to a cork board.
- Students must determine the path, that the code would follow.
- This is represented using string and pushpins.

Final Project Examples

Particle Models

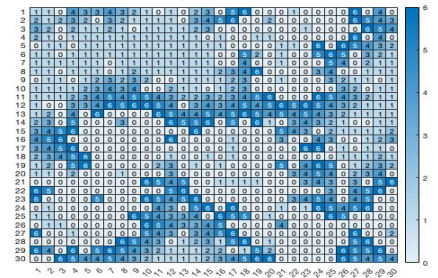
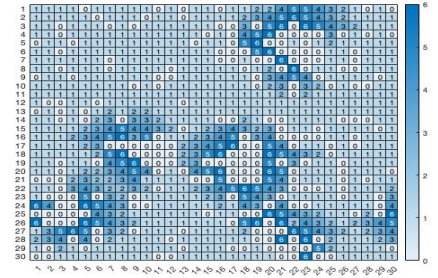
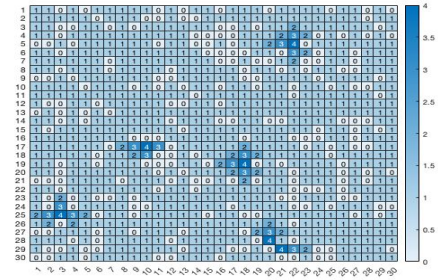
- Wild Fire Control
- Disease spreading

GUI Application

- Photo editor
- Simple Game (Tic-Tac Toe, connect 4)

Machine learning Application

- Students choose their own data set



Questions?

Feel free to contact me at

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