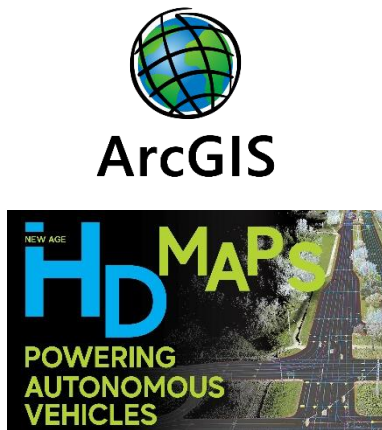


# CS 225: Spatial Computing

Fall 2021

Instructor: Amr Magdy



## Overview

Spatial data is ubiquitous in different applications, e.g., public health, map applications, agriculture, transportation, and public safety, and in different scientific disciplines, e.g., geographic information sciences, environmental sciences, and behavioral sciences. The increasing volume and prime importance of spatial data have motivated significant efforts to exploit the computing advances in powering different spatial applications for over two decades. In the heart of this process is modeling, managing, and analyzing spatial data. This course covers the main concepts behind existing technologies in spatial applications in addition to future directions where spatial data is driving innovations in both applications and science. The course introduces spatial computing with coverage for spatial data models, storage, indexing, querying, and integration with the modern machine learning techniques. In addition, the course allows hands-on experience on both low-level and high-level spatial applications building on existing spatial data platforms.

## Syllabus

### Main Topics

- Introduction to Spatial Computing
- Spatial Relationships and Data Models
- Spatial Data Storage and Indexing
- Spatial Query Processing
- Spatial Networks
- Geo-visualization
- Spatial Data Mining
- Trends and Innovations in Spatial Applications

### Main Activities

- Paper presentations
- Student projects
- Spatial Technologies Hands-on