Lecture

Course Overview

EE 565: Position, Navigation and Timing

Lecture Notes Update on January 17, 2023

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In collaboration with
Stephen Bruder, Electrical & Computer Engineering, Embry-Riddle Aeronautical University

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1 Course Outline

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- Reference Textbooks:
  - Principles of GNSS, Inertial, and Multisensor Integrated Navigation Systems, Second Edition, Paul D. Groves, 2013.
  - Fundamentals of Inertial Navigation, Satellite-based Positioning and their Integration, Aboelmagd Noureldin, Tashfeen B. Karamat and Jacques Georgy.
- Recommended Software: MATLAB or Octave
- Lectures: Tues and Thu 11:00-12:15 Workman 117
- Instructors: Aly El-Osery and Kevin Wedeward

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2 Grading

Grading

- Homework assignments: 30%
- Midterm exam: 20%
- Projects: 40%
- Class participation: 10%

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3 Course Description

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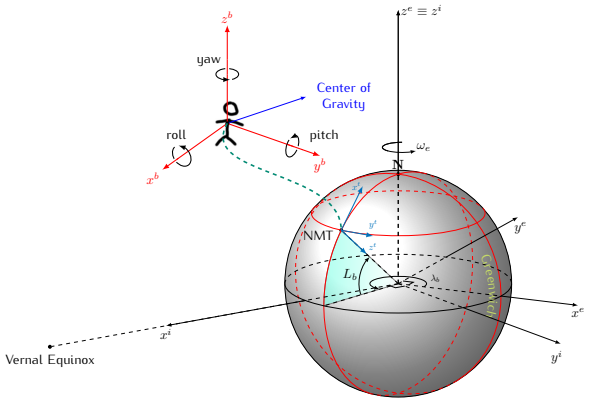
This course will cover the basics of terrestrial location and navigation with an emphasis on practical exposure to technology.



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Part I: Navigation Mathematics

- Introduction to navigation
- Coordinate frames
- Kinematics
- Earth surface and gravity
- Frame transformation

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Part II: Navigation Sensors and INS Mechanization

- Accelerometers
- Gyroscopes
- Error Characteristics
- Inertial navigation equations

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Part III: INS/GPS Integration

- GPS
- Kalman filtering
- Integration architecture
- System Model
- Measurement model

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