Introduction

- topics
- course material and requirements

Course topics

Motivation

- computers are inexpensive, fast, have lots of memory
- it is easy to collect, store, transmit large amounts of data
- numerical software makes advanced algorithms simple to use

Main topics

- numerical linear algebra, focusing on least squares and extensions
- nonlinear least squares and nonlinear equations
- introduction to floating point numbers and rounding error
- applications in signal and image processing, control, machine learning, . . .

High-level languages for numerical computing

- MATLAB (how to get MATLAB)
- GNU Octave (www.octave.org)
- Julia (www.julialang.org)
- Python (via the libraries NumPy, SciPy, matplotlib, . . .)
- R (www.r-project.org)
- . . .

Course material and requirements

Course material

- textbook available online at web.stanford.edu/~boyd/vmls
- additional notes, slides, homework assignments at the 133A Bruin Learn website
- lecture slides from previous years: www.seas.ucla.edu/~vandenbe/ee133a

Course requirements (see syllabus on Bruin Learn course website)

- weekly homework, most assignments include programming exercises
- closed-book midterm exam (Thursday, October 27, 2pm–3:50pm)
- closed-book final exam (Wednesday, December 7, 11:30am–2:30pm)

Software

- you can use MATLAB/Octave or Julia
- for an introduction to Julia, see the *Julia Language Companion* to the textbook at

  web.stanford.edu/~boyd/vmls