

Using Matlab for LSA

Introduction to Information Retrieval

CS 221

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Learning Objective

“Be able to use MATLAB to conduct LSI analysis on your own data”



What is MATLAB?

- A numerical computing environment
- An interpreter for a specialized programming language
- Many libraries for complex mathematical operations
- Support for:
 - Matrix Operations
 - Graphing
 - User Interfaces
- Great for rapid prototyping complex algorithms
- Cross -platform



What MATLAB isn't

- A production ready commercial software development tool
- Free
- Open-source



Where is MATLAB at UCI?

- CS 364 Lab - about 30 machines with one machine licenses
- NACS PC Labs - “mpc cluster”
- Remote access through openlab if you buy a license and tell ICS support.
- Student edition is about \$100.00
- Open-source alternative called “octave” is available.

<http://www.ics.uci.edu/~smyth/courses/matlab.html>



Demo

- 6 documents
 - Wikipedia entry for “baseball bat”
 - Wikipedia entry for “bat”
 - Wikipedia entry for “coffee”
 - Wikipedia entry for “starbucks”
 - Starbucks’ home page
 - First page of a recent publication of mine



Demo

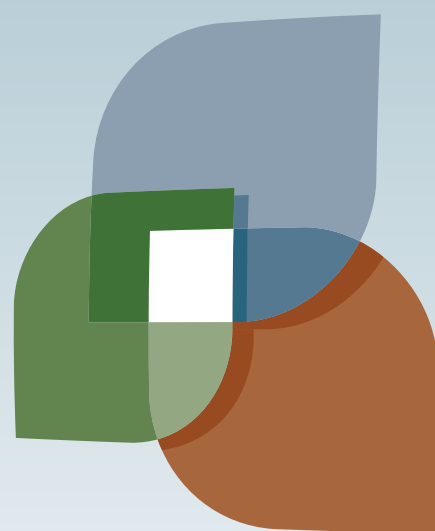
- I pulled out 14 words
 - BALL
 - BASEBALL
 - BAT
 - CALIFORNIA
 - COFFEE
 - COMPANY
 - ENCYCLOPEDIA
 - IRVINE
 - RUN
 - SPECIES
 - STARBUCKS
 - STORES
 - UNIVERSITY
 - USERS



Demo

- Calculate the TFIDF score
- Plot the documents on a two term axis
- Perform SVD decomposition
 - Validate decomposition
- Reduce rank of system
- Show “M”
 - Demonstrate what SVD is capturing
- Execute a query





L U C I

