CEE 3804 Closing Remarks

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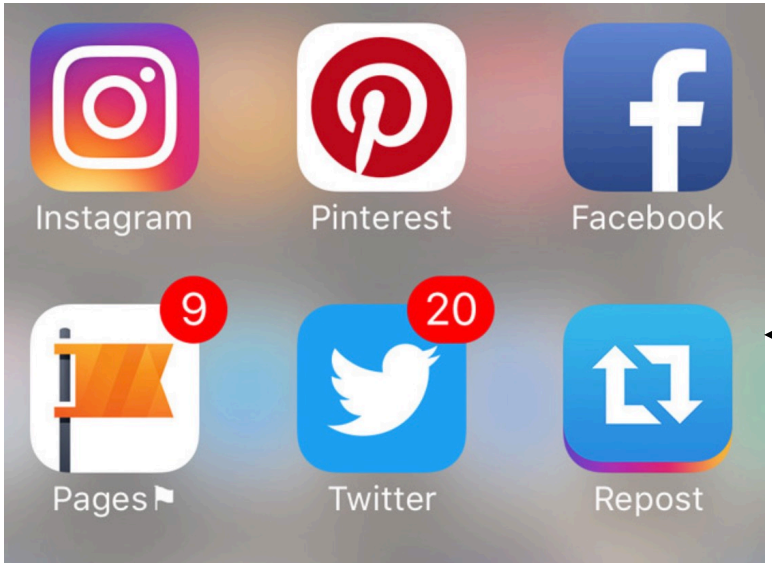
Spring 2017

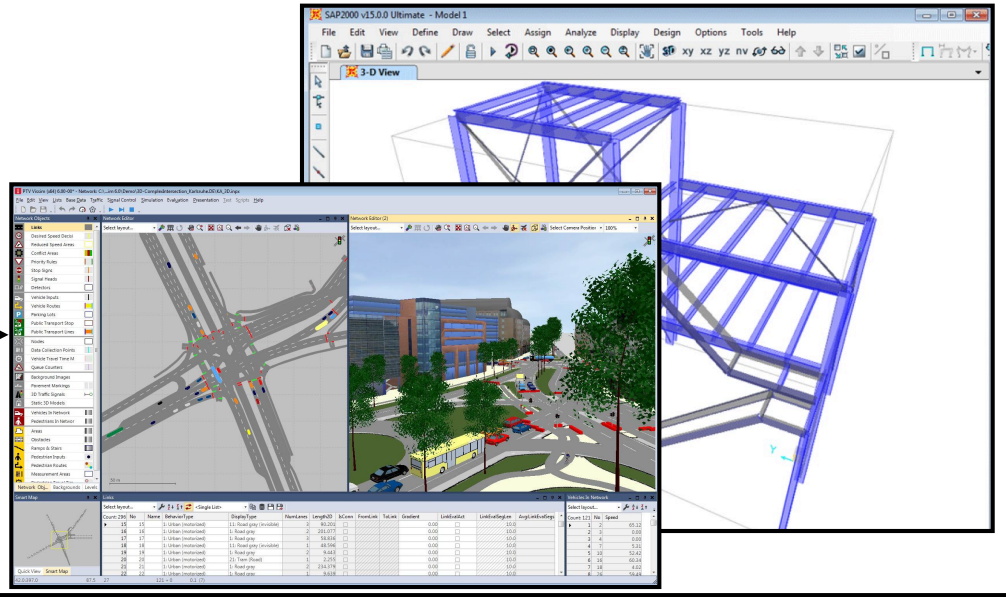
Review of Course Objectives

- Create user-defined functions in Excel and Matlab
- Perform linear algebra and matrix operations and their application to solve Civil Engineering problems
- Solve sets of linear equations and determine roots and nonlinear equations
- Construct, interpret and solve simple optimization problems (using Excel Solver)
- Develop and program engineering analyses using Matlab and Excel
- Create and modify simple user interfaces using a programming environment (Excel and Matlab).
- Understand the principles of relational databases and construct simple databases
- Learn to solve civil engineering problems with differential equations using Matlab and/or Simulink
- Perform numerical integration (using Matlab)

Keep up with Computers and Applications

- Just like learning Snapchat, Instagram or Facebook, it is important to keep up with computer applications in your field
- Having knowledge of computer applications will make you a better engineer and simplify your life





Keep up with Computers

- Keeping up with computer applications means:
  - Have an attitude of “life-long learning”
  - Dedication to learn something new or an improved product
  - Persevere in difficult and stressful job conditions
- Remember Thomas Alva Edison words:
  - *"Genius is one per cent inspiration, ninety-nine per cent perspiration” (Edison in Harper's Monthly Magazine, 1902)*
- Be humble and recognize that computers can be useful and frustrating under a variety of conditions
- Backup your data (all computers fail)

Computers and the Global Village

- More applications are now written by diverse Global teams
- Our ability to design and build new infrastructure is only as good as our ability to convince society to pursue it
- Computers can improve designs and potentially bring down cost of designs
  - Examples:
  - 9% highway bridges in the US are deficient
  - 1930's technology in the railroad system of the US (Penn Station rail station problems reported lately)

Computers and Infrastructure

- ASCE report card on bridges : C+
- 9.1% of the highway bridges in the US are structurally deficient
- The average bridge is 43 years old

source: ASCE web site

Computers and Infrastructure

- ASCE report cards
- 17% of the US dams constitute a high-hazard potential
- 1 trillion dollars needed to keep communities with clean drinking water

source: ASCE web site

Computers and Engineering Practice

- What is the role of computers at improving the US infrastructure?
- Engineers that do not employ latest technologies will take longer to develop acceptable solutions to these problems
- Prosperous nations take infrastructure development and maintenance seriously
  - Examples: Singapore, Norway, etc.
  - Engineers with computer skills can be more attuned to the problem solutions

Final Exam Topics

- Functions in Excel and Matlab
- VBA programming (need to know basic syntax)
- Matlab programming (need to know basic syntax)
- Optimization problems (using Excel Solver to solve linear programming type problems)
- Differential equations using Matlab and/or Simulink
- Numerical integration (using Matlab)
- Relational database (Access)