COMP 7720/7726/4970 • Summer 2018

Software Reengineering

What is reverse engineering?

Why do we do it?

How do we do it?

Don't answer these questions yet ...

Course Description

- **Catalog**
  - COMP 7720/7726/4970: Software Reengineering
  - Credits: 3 (3 hours lecture)
  - Official Description: Processes, methods, and ~~tools~~ associated with re-engineering software systems.
  - Prerequisites: working knowledge of assembly language, C, and operating systems

- **Strategic Objectives**
  - To understand the fundamental techniques of reverse engineering
  - To gain experience with reversing tools
  - To get hands-on experience and be cool

Focus on reverse engineering

Syllabus

▶ Week 0: Reverse engineering rationale

▶ Week 1: Low-level software

▶ Week 2: Windows fundamentals

▶ Week 2: Reversing tools

▶ Week 3: Discovering APIs

▶ Week 4: File formats

▶ Week 5: Auditing program binaries

▶ Week 6: Malware

▶ Week 7: Copy protection

▶ Week 8: Anti-reversing techniques

▶ Week 9: Breaking protections OR Web Reverse Eng.

▶ Week 10: Wrap-up, poster sessions

* Time permitting

Instructors

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You Need...

▶ *Reversing: Secrets of Reverse Engineering*
Eldad Eilam (Wiley, 2005), ISBN: 0764574817

▶ Computer for analyzing software artifacts

  ▶ Set up VirtualBox or other virtual machine software

  ▶ Install Kali Linux in the virtual machine

▶ Course notes, readings, references
available via Canvas (auburn.instructure.com)
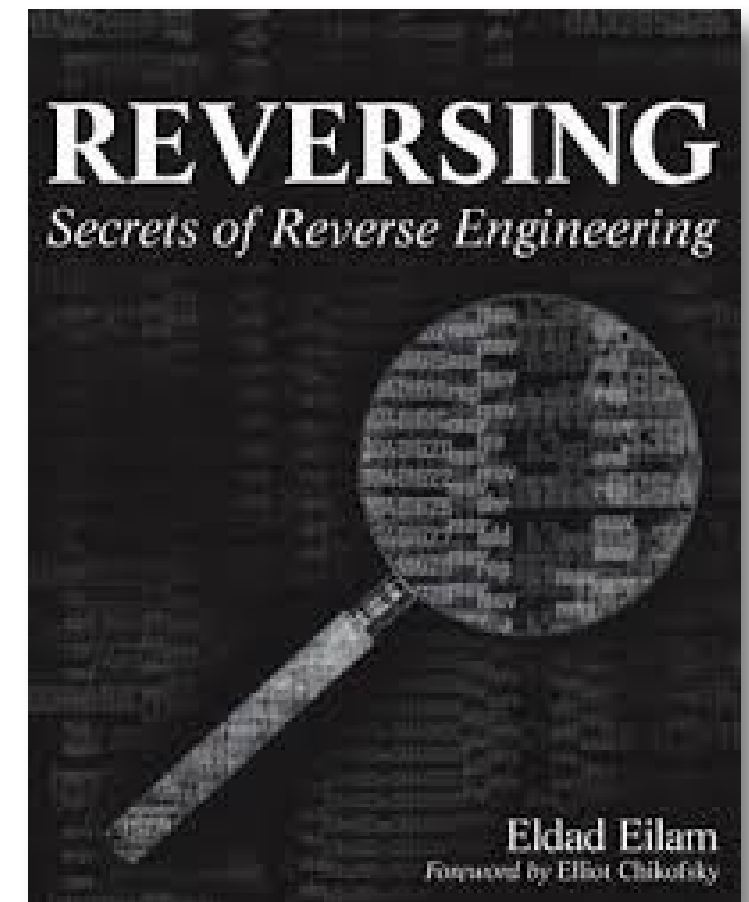
Work Outlook

▶ **Practicals**

  ▶ hands-on exercise

  ▶ five or six, drop the lowest score

▶ **Quizzes**

  ▶ short, unannounced assessment

  ▶ drop the lowest score

▶ **Project**

  ▶ in-depth analysis of artifact

  ▶ done in teams of three-to-four students

▶ **Presentation**

  ▶ discussion of a topic of choice

COMP4970
50% -- Practicals*
30% -- Team project
10% -- Unannounced quizzes*
10% -- Free points

COMP7720/7726
50% -- Practicals*
30% -- Team project
10% -- Unannounced quizzes*
10% -- Team presentation

* lowest score will be dropped

Expectations

▶ *The basic pedagogical precept ... is that all genuine learning arises from the activity of the learner's own mind. It may be assisted, guided, and stimulated by the activity of teachers. But no activity on the part of teachers can ever be a substitute and become the sole cause of a student's learning. When the activities performed by the teachers render students passive, the latter cease to be learners—memorizers, perhaps, but not learners.* —Mortimer Adler

Our Responsibilities:
- Be present (mentally & physically)… and prepared
- Guide
- Facilitate
- Assess
- Excite

Your Responsibilities:
- Be present (mentally & physically)… and on time
- Be receptive to new ideas
- Interact
- Get involved
- Get excited

Policies

- Be here physically
- Be here mentally
  - *from http://www.studygs.net/listening.htm:*
    - Be other-directed:
      - Focus on the person communicating
      - Follow and understand the speaker as if you were walking in their shoes
      - Listen with your ears but also with your eyes and other senses
    - Be aware:
      - Non-verbally acknowledge points in the speech
      - Let the argument or presentation run its course
      - Don't agree or disagree, but encourage the train of thought
    - Be involved:
      - Actively respond to questions and directions
      - Use body position (e.g. lean forward) and attention to encourage the speaker, signal interest
- Be polished
- Be honest