Conflict in Cyberspace

Graduate Seminar

Fall 2023

Instructor: Anton Sobolev
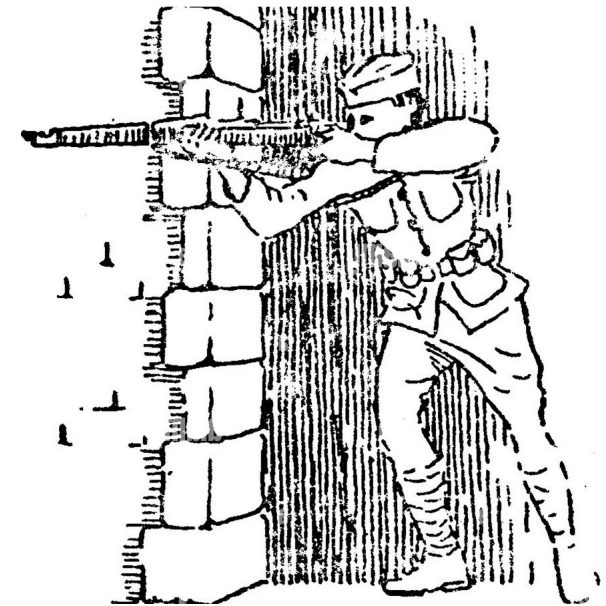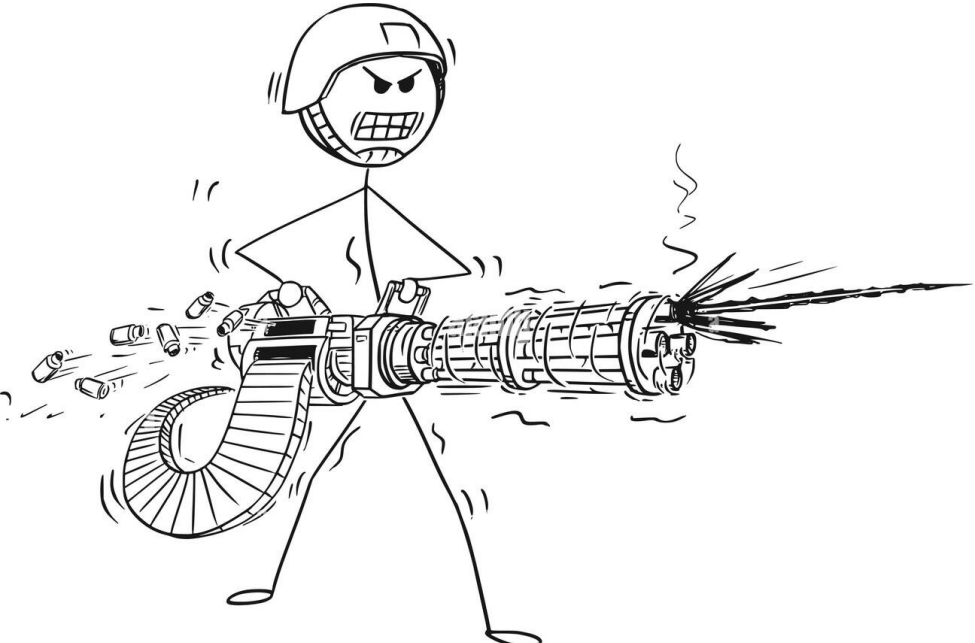
TAs: Rahul Thakar

*Week 1:
Introduction and
Class Logistics*

CyberSecurity

**Policy Science Perspective
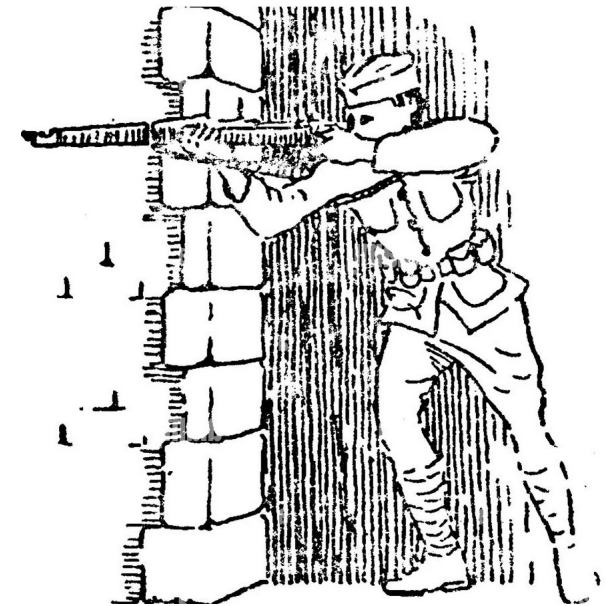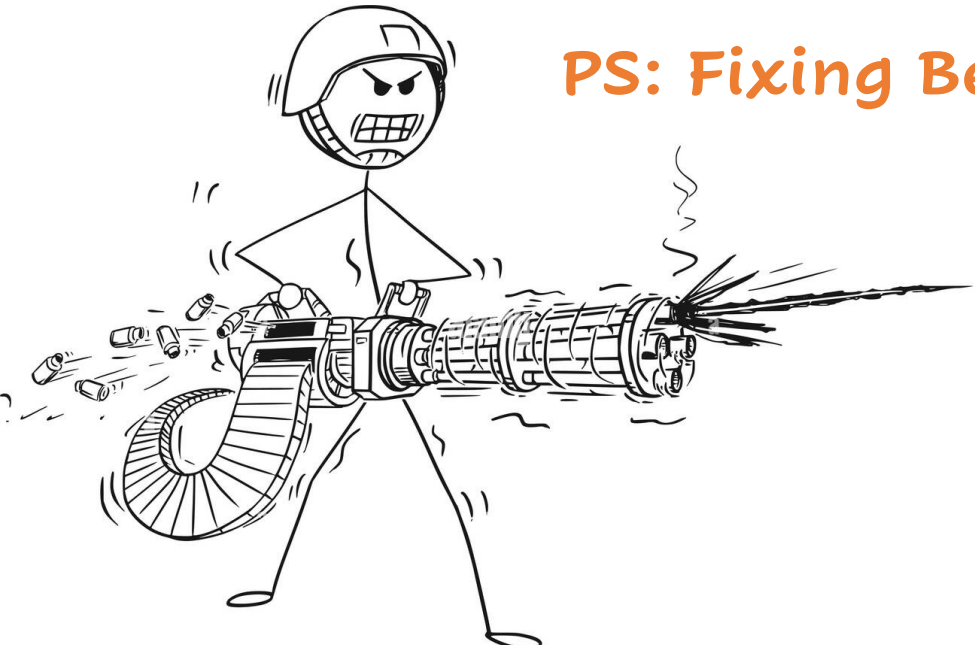vs
Computer Science Perspective**

Cyber Criminals

IT Security Team

CyberSecurity

**Policy Science Perspective
vs
Computer Science Perspective**

Cyber Criminals

PS: Fixing Behavior

IT Security Team

CS: Fixing Code

CyberSecurity

Policy Science Perspective
vs
Computer Science Perspective

- ❑ Understanding Context
- ❑ Understanding Incentives
- ❑ Understanding Data
- ❑ Making Inferences

Cyber Criminals

PS: Fixing Behavior
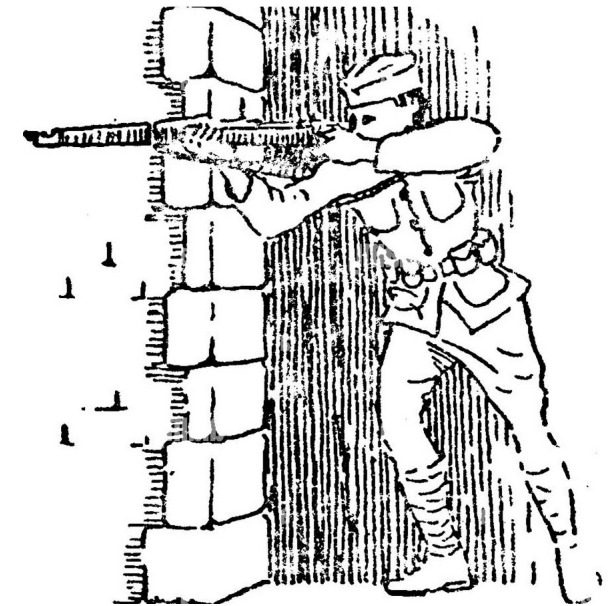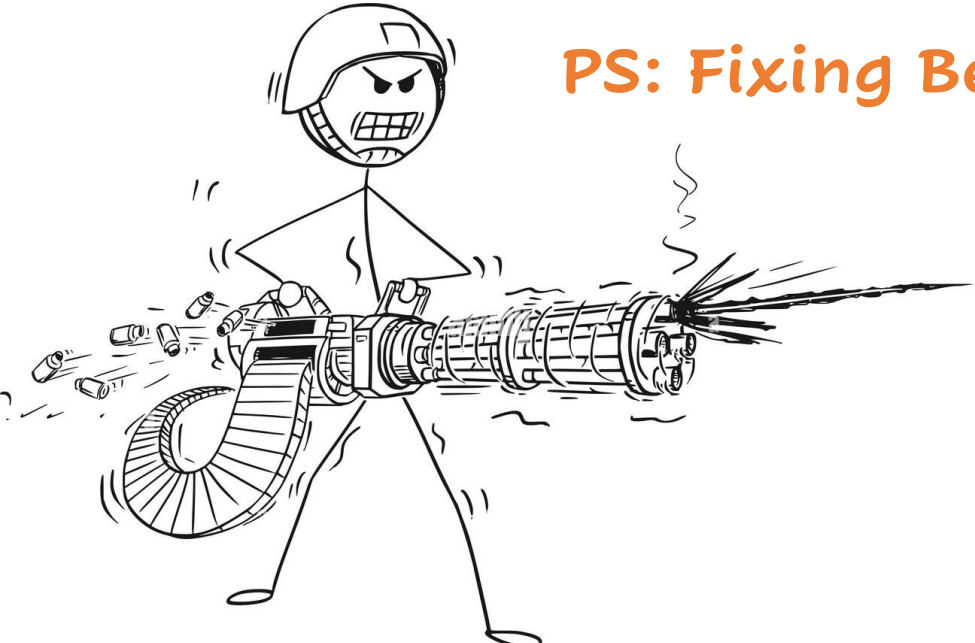
IT Security Team

CS: Fixing Code

Goals of this course (a lot!)

- Introduce a broad context of cybersecurity ⇝ [political] conflict
  - Security: Physical Space VS Cyber Space
- Critical Thinking ⇝ Scientific Reasoning [my next class]
  - Information consumption (academic articles, technical reports, news)
  - New knowledge production (identify a problem, formulate a proper question, required means)
- How to work with data (in **R**)
  - Collect, process, and visualize ⇝ Descriptive inferences
  - Replicate ⇝ Conduct your own analysis

⇝ Ability to solve complex tasks / find answers
to questions you did not face before

Place of this class in the program

Social Sciences

Cyber Conflict

OSINT

Cyber Policy

Cyber Law

Cyber Psychology

Context

Management Sciences

Cybersecurity Fundamentals

Incident Management

Cyber Governance

Capstone Seminar

Computer Science

Malware Analysis

Data Security And Privacy

Critical Infrastructure

Coding Skills

Roadmap

Module 1. Background: History, Frameworks, and Tools
Understanding conflict
A brief history of communications
Technology steps in

Module 2. Cyberspace: The Current Scene
How to work with conflict-related data: Workshop
Cyberspace: Governing and capabilities
Preparing for the conference
Political map of cyberspace: Mini-conference

Module 3. Cyber Conflicts: Selected Topics
How cyberspace changes military operations
How cyberspace changes civil resistance
Content moderation & Internet censorship

Module 4. Cyber Aspects of Conflict: Case-Studies
Domestic conflicts
International conflicts
Fall Break: No class
Group Presentations - 1
Group Presentations - 2

Conflict

Com. Technology

Com. Technology ⤳ Conflict

What is a cyberspace and how to study it?

How cyberspace shapes conflict

Learn to produce your own research

Roadmap

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Problem Sets

Intro to R

Data Management

Data Visualization

Learn to describe a case-study with data

OpenAI Assistance

Learn new methods on your own

Learn to evaluate research by replication

Learn to produce your own research

Roadmap

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Module 3. Cyber Conflicts: Selected Topics
Network analysis of conflicts
How cyberspace changes military operations
How cyberspace changes civil resistance
Internet censorship
Module 4. Cyber Aspects of Conflict: Case-Studies
Arab Spring
Russia-Ukraine war
Fall Break: No class
Group Presentations - 1
Group Presentations - 2

Problem Sets

Intro to R

Data Insights

Data Visualization

Learn to describe a case-study with data

OpenAI

Boost your coding performance

Learn to evaluate research by replication

Roadmap

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Problem Sets

Intro to R

Descriptive Inferences

Data Visualization

Learn to describe a case-study with data

Network Analysis

Learn new methods on your own

Learn to evaluate research by replication

Learn to produce your own research

How class is organized

During the week

New topic introduced

Discussion of readings on previous week topic

New topic introduced

2nd half of the class

1st half of the class

2nd half of the class
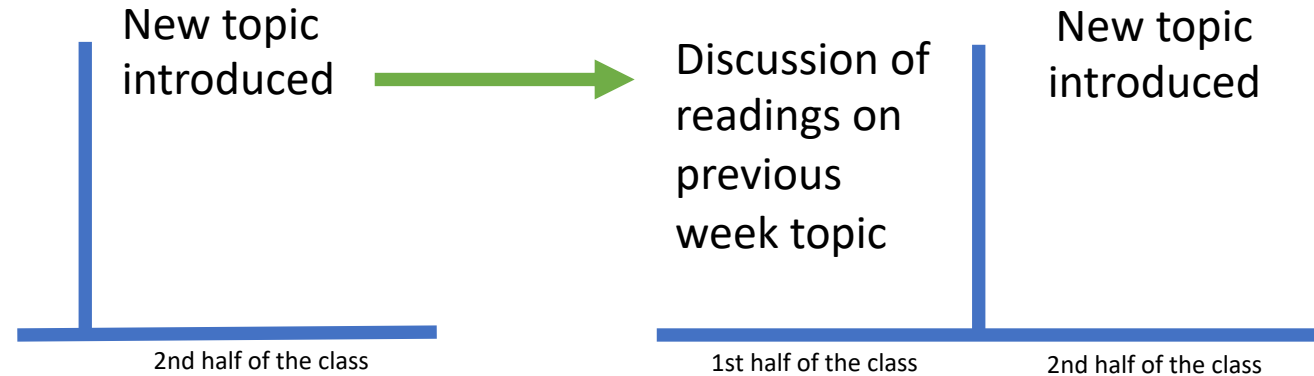
Quiz on required readings (before the class)

Inside the classroom

Required readings discussion lead by group 1

New topic introduced
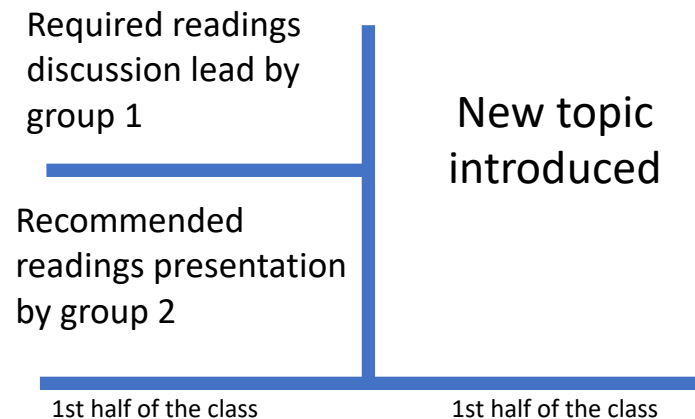
After-discussion reactions (class forum, due next class)

Recommended readings presentation by group 2

1st half of the class

1st half of the class

Schedule by weeks

Activity	Module 1. Background				Module 2. The Current Scene		
	W1	W2	W3	W4	W5	W6	W7
Discussion			G1	G3	G6	G4	
Presentation			G5	G4	G3	G2	Presentations
Other		L	L	L	W	W	

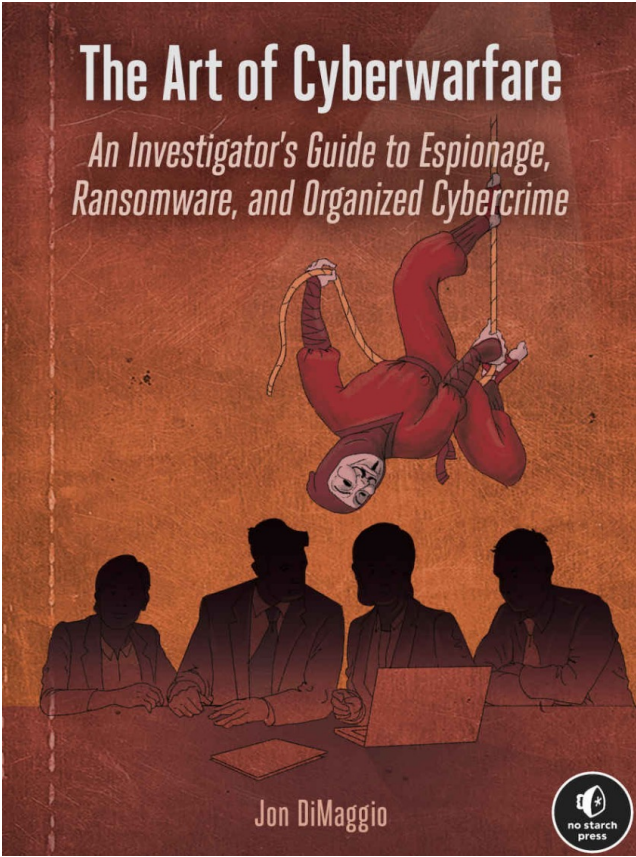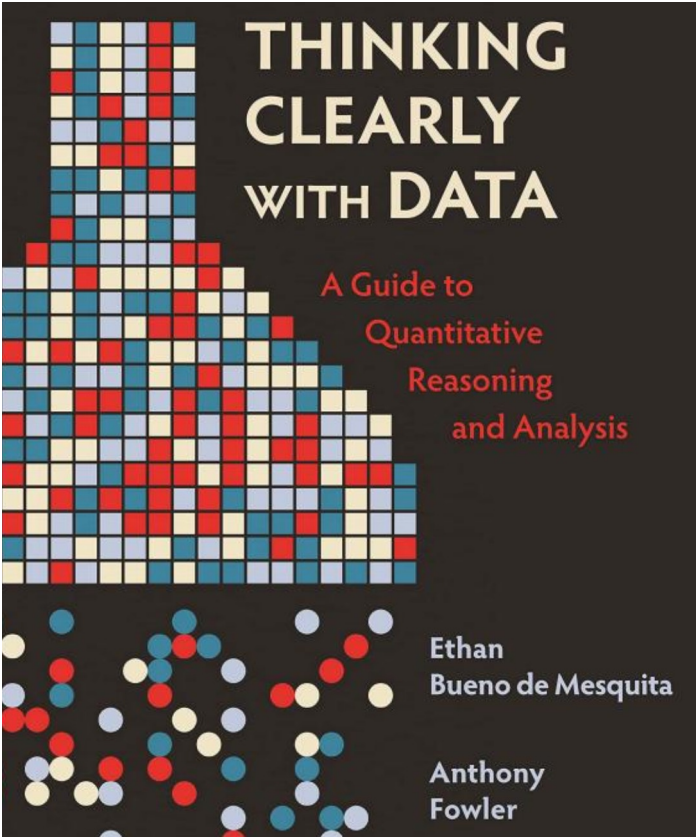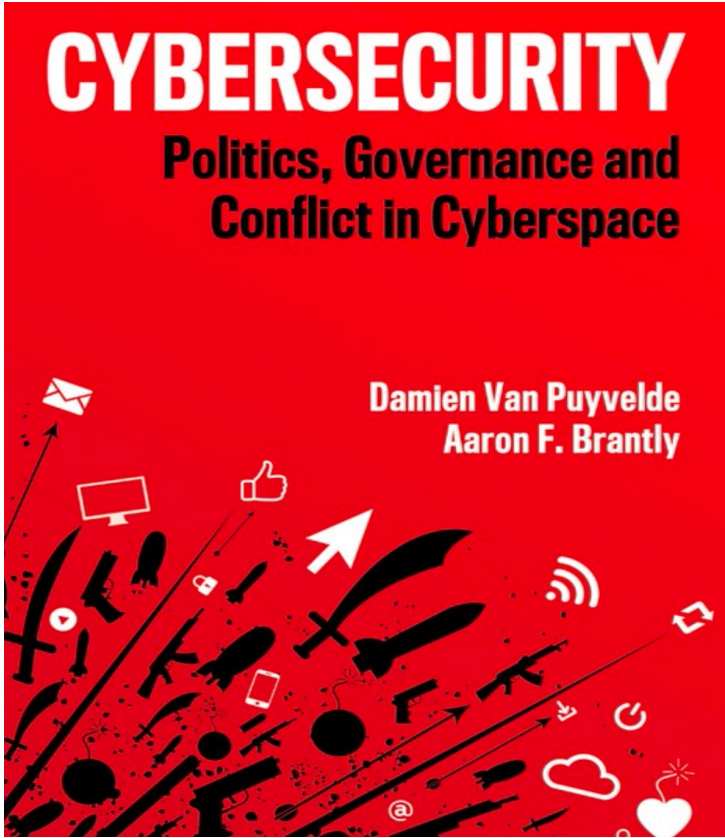| Module 3. Selected Topics						Module 4. Case-Studies		
W8	W9	W10	W11	W12	W13	W14	W15	W16
W	G1	G2/G3	G4	G5	G6			
	G6	G1	G5/G4	G3/G2	G1	Fall Break		Presentations
L	L	L	L	L	C			

Grading (s)

Next steps

- Register on DataCamp and complete the Assighment #1 and #2
- Take class survey: office hours, deadlines
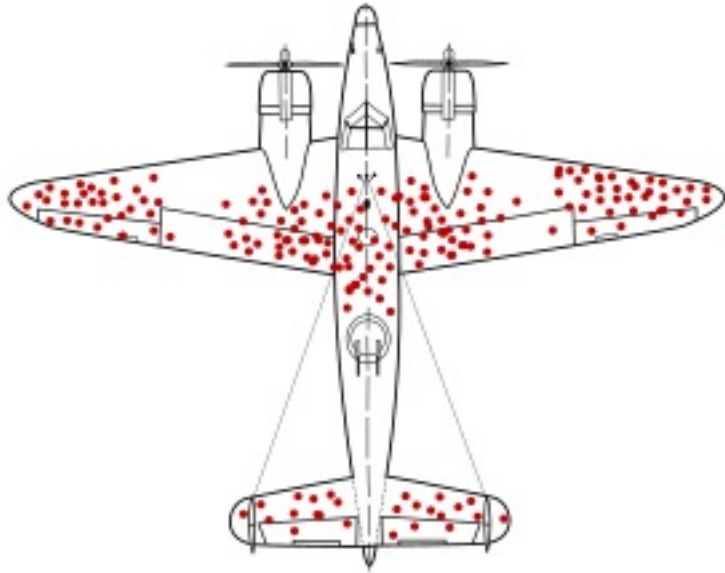- Read the required readings for the next class

Next week class
- Reading Quiz 1
- Coding Quiz 2
- Pre-Recorded Lecture
- Bring Laptops!

Textbooks

CYBERSECURITY
Politics, Governance and Conflict in Cyberspace

Damien Van Puyvelde
Aaron F. Brantly

THINKING CLEARLY WITH DATA

A Guide to Quantitative Reasoning and Analysis

Ethan Bueno de Mesquita

Anthony Fowler

The Art of Cyberwarfare
An Investigator's Guide to Espionage, Ransomware, and Organized Cybercrime

Jon DiMaggio

no starch press

Critical Thinking Examples

Survivorship bias

Policy-making and Context

Question VS Data

Question: Long-Term Costs of Cyber Attacks

Data:
Costs: Change in Sales
Cyber Incident: Reported Incident