CSCI 680: Computer & Network Security

Lecture 14

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Derived from slides by William Enck

Announcements

- Research Plan Assigned!
  - Due on November 14, 11:59PM
  - Start the research project before submitting the plan, i.e., now.

Midterm Grades!

Security Research Methods II

Why write a paper?

- There are many reasons to write a paper:
  - Articulate a new idea, thought, or observation ...
  - Document your research ...
  - Talk about new (observed) phenomenon ....
  - Advance your career ...
  - Because you have to ...

- *Reality*: publication is the coin of the realm in science, failure to do this successfully will lead to failure. You have to be effective at this to be a good (a) graduate student, (b) faculty member, or [sometimes] (c) researcher in professional research laboratory (IBM/AT&T/MS)

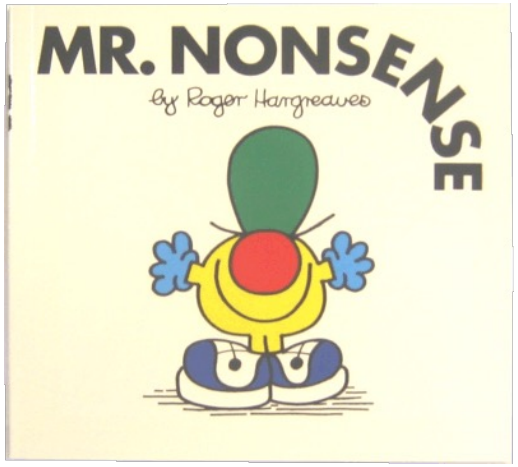
Where to publish?

- Venues for publication:
  - Tech report
  - Workshop
  - Conference
  - Journal

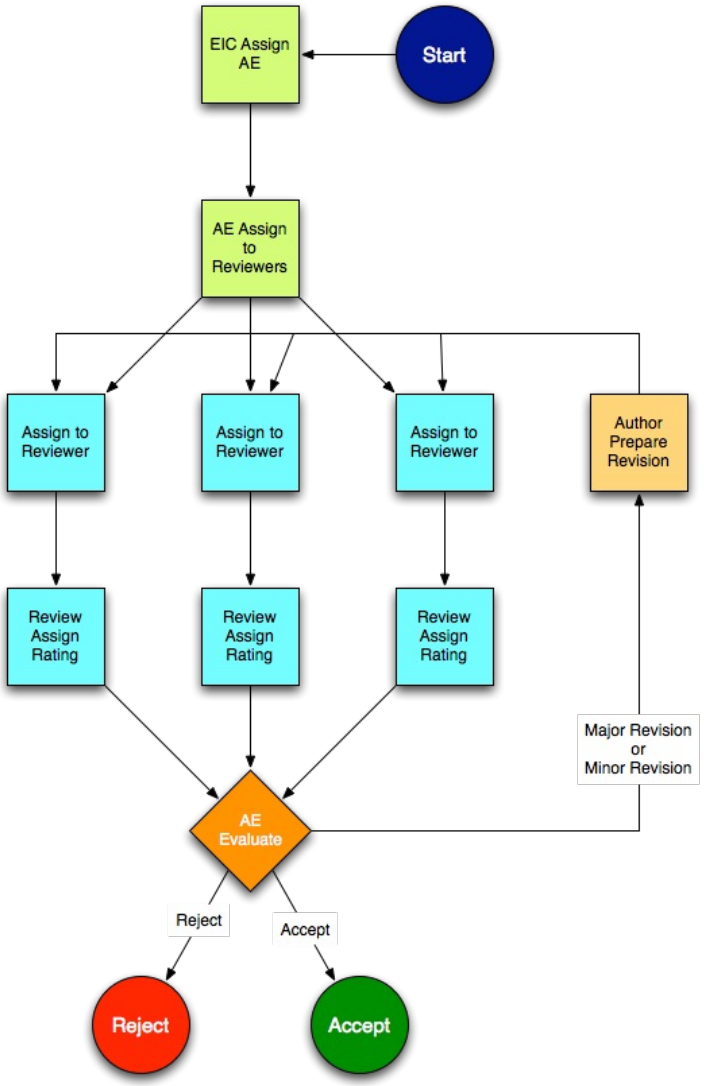
- Often your work will work through these from *preliminary* to *archival* versions of the work, sometimes branching or joining.
- *Book*: less frequent, more work.

Publication Tiers

- Not all publication venues are valued the same. Publication "tiers" tell the story
- 1st tier - IEEE S&P, USENIX Sec, CCS, NDSS, *TOPS (formerly TISSEC)*, *JCS*
- 2nd tier - ACSAC, ACNS, ESORICS, CSF, RAID, AsiaCCS, *TOIT*
- 3rd tier - SecureComm, ICISS, WiSec, CODASPY
- 4th tier - HICS
  - SCIgen (WMSCI 2005)
  - http://pdos.csail.mit.edu/scigen/

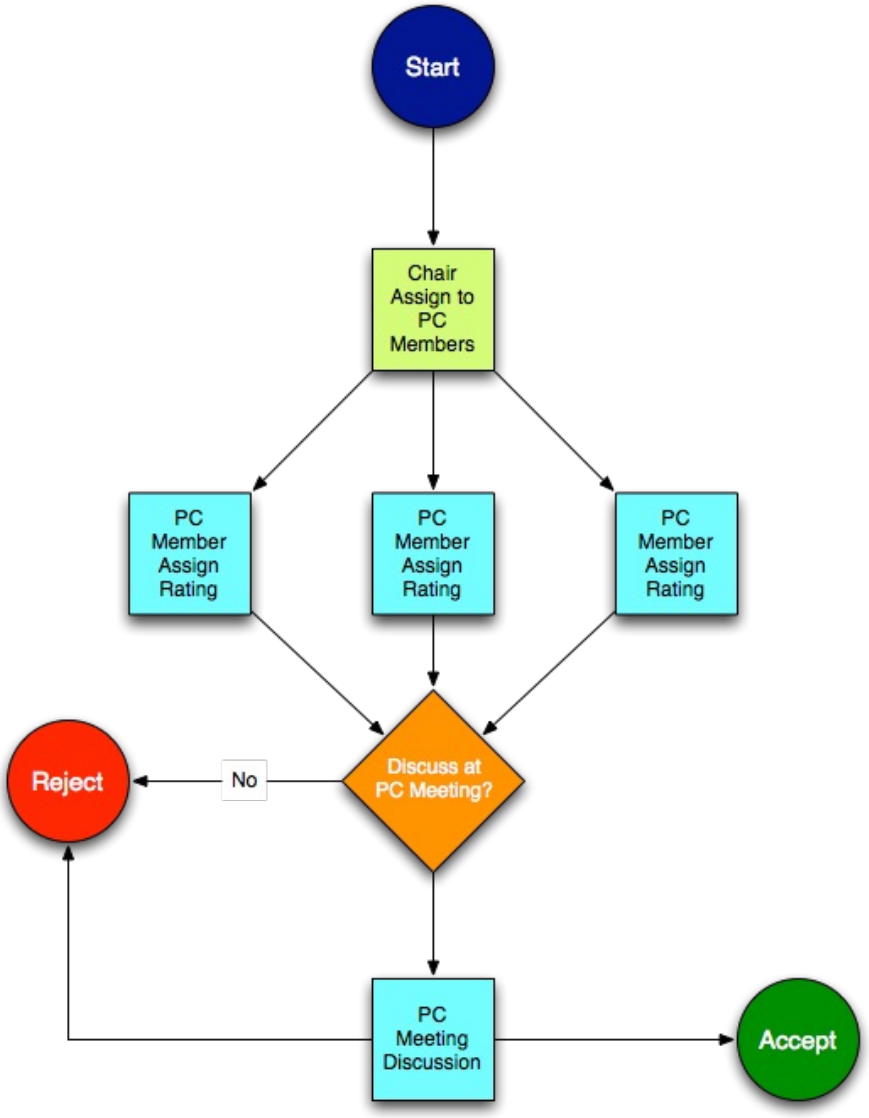


Journal publication



- The *editor-in-chief* (EIC) receives the papers as they are submitted.
- The papers are assigned to *associate editors* for handling.
- *Anonymous reviewers* rate the paper:
  - Accept without changes
  - Minor revision
  - Major revision
  - Reject

Conference Publication



- The *PC Chair* is the person who marshals the reviewing and decisions of a conference. This is different than the *general chair*.
- *PC members* review, rate and discuss, the paper, then vote on which ones are accepted.
- The *acceptance rate* is the ratio of accepted to submitted papers.

Paper evaluation

- A paper is evaluated on
  - Novelty
  - Correctness
  - Impact
  - Presentation
  - Relevance
  - "hotness"

Parts of a paper

- Parts of paper (vast generalization)

1. Abstract
2. Introduction
3. Related Work/Background
4. Solution/Problem
5. Evaluation/Analysis/Experiment
6. Discussion (often, but not always)
7. Conclusions

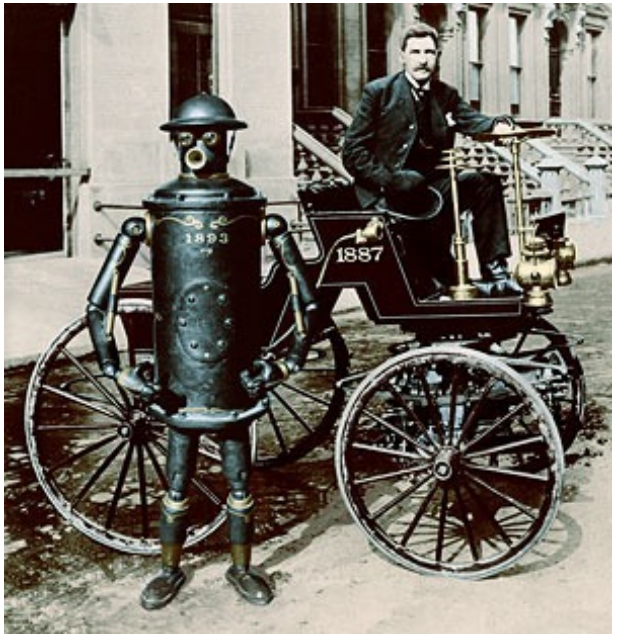
Abstract

- One sentence each for:
  - Area
    - Topic of work
  - Problem
    - What's the issue?
  - Solution
    - How do you propose to address the problem?
  - Methodology
    - What's the experiment?
  - Results
    - What did you find?
  - Take Away: Lesson

Abstracts for course projects!

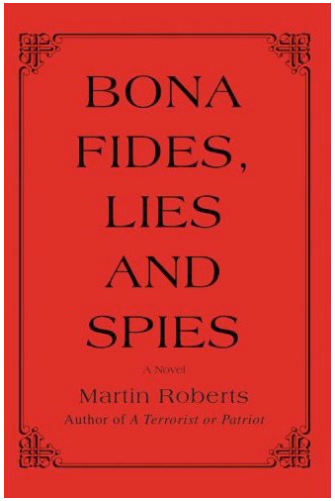
Introduction

- One paragraph each on:
- Area
  - More elaborate
- Problem
  - Scenario
- Why is problem not solved
  - Brief of related work or the challenge
- Proposed insight ("In this paper, ...")
  - What is the experiment?
- Contributions -- What will the reader learn?
- Boilerplate outline (?)



Related work

- This is a statement of the work that led to this one.
  - who this work relies on
  - who has done work in the area
  - areas that inspired this work (not just technology)
  - Not a laundry list
- There are several reasons for related work section:
  - Motivate the current work
  - Differentiate from past work
  - Establish "bona fides"



Motivation, Background

- **Motivation**
  - Why is this a problem?
  - Motivating Example: Alice…
  - Why isn't the problem solved?
    - Forward/backward reference to the related work.
- **Problem, assumptions**: Problem statement, threat model, TCB.
- **Background:** What all does the reader need to know to understand your approach?
    - Already known material related to the solution
    - Tip: You can always move text from the design to the background, to focus on the *novel contributions in the design*.

System Architecture and Design

- How do you solve the problem?
- General Architecture / Overview
- What are the
  - Design Goals?
  - Challenges?
  - Contributions of your design (i.e., the design decisions) that help overcome the design challenges, hence achieving the design goals?

Experiment

- Experiment
  - Means of showing truth
  - Big Insight -- Hypothesis -- Claim
    - Show why it is interesting
  - Expected Results
    - Informal proof/argument that is true
- Experiment types
  - *Empirical* - measure some aspect of the solution
  - *Analytical* - prove something about solution
  - *Observational* - show something about solution

Implementation

- Experimental Platform
  - Exact specification of platform
  - Design may have more than implementation -- what did you implement?
  - How are key design features/mechanisms implemented?
  - *Not the design*: Separating the novel design contributions/decisions from their implementation is often a challenge)

Results vs Findings

- Results
  - Summarize -- what do the results mean?
  - Specific experiments
    - We did X, saw Y
  - What do the experiments prove
  - What other experiments would you want to do based on these results?
- Key Findings
  - What do the results mean?
  - What are the lessons?
  - Lead to the takeaway.

Conclusion

- Like the abstract in past tense
- Problem
  - What was the problem?
- Solution
  - What was the insight and why was it expected to work?
- Method and Results
  - What did you find?
- Take away: Lesson
- Future work

Hint

- Intro: tell them what you are going to tell them
- Body: tell them
- Conclusion: tell them what you told them.