



**Ethics in
Electrical and Computer Engineering**

**Lecture #11, Supplement:
Honesty**

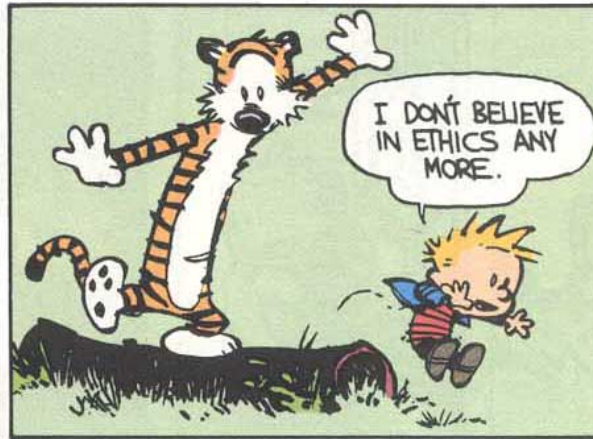
Prof. K.M. Passino

The Ohio State University

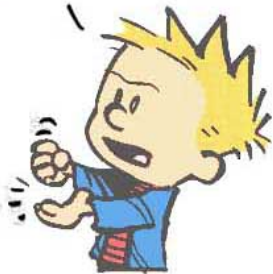
Department of Electrical and Computer Engineering

Calvin and Hobbes

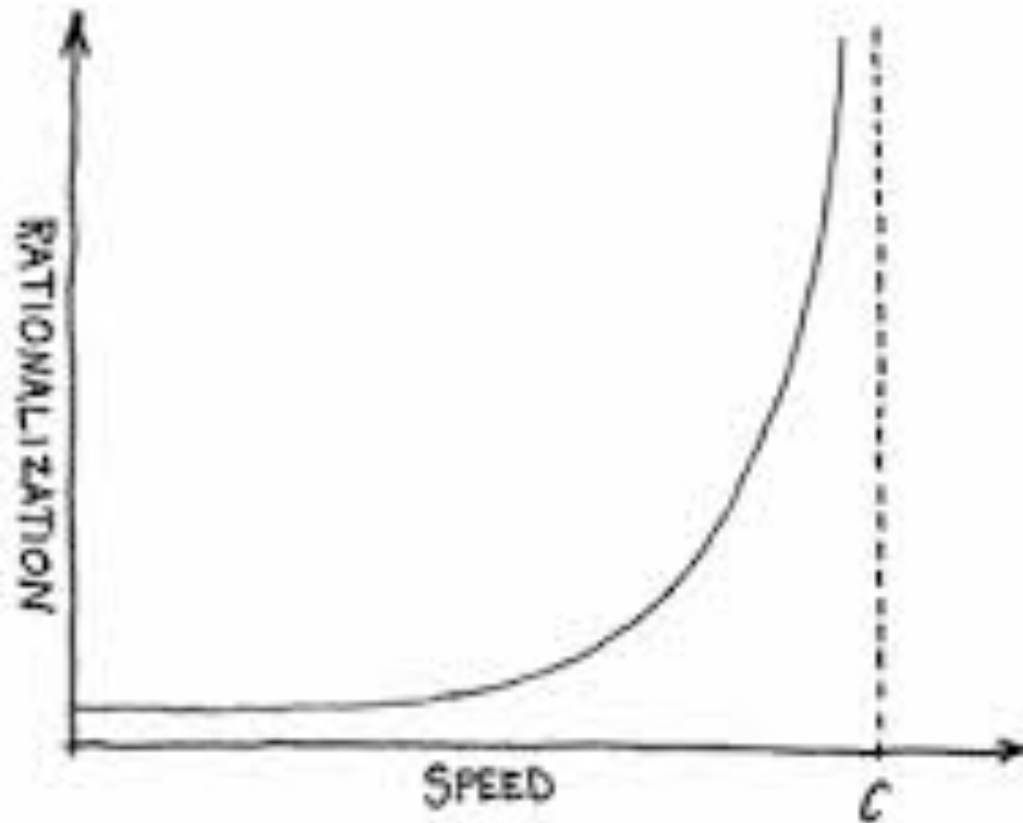
BY WATTERSON



GET WHAT YOU CAN WHILE THE GETTING'S GOOD - THAT'S WHAT I SAY! MIGHT MAKES RIGHT! THE WINNERS WRITE THE HISTORY BOOKS!



MORAL RELATIVITY



RELATED TO MORAL RELATIVISM, IT STATES THAT ETHICS BECOME SUBJECTIVE ONLY WHEN YOU APPROACH THE SPEED OF LIGHT.

THAT IS, IT'S OK TO BE SELF-SERVING, STEAL, AND MURDER AS LONG AS YOU'RE GOING REALLY, REALLY FAST.



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Research Integrity



- Research in engineering occurs in universities, government labs, corporations
- *Truthfulness takes on heightened importance* in research because research aims at discovering and promulgating truth.
- Sloppy research is fundamentally dishonest.
- **Truthfulness in research:**



- Honesty in conducting/reporting experiments
- No theft of others' results
- No misuse of research funds



- National Science Foundation (NSF): defines *misconduct* in science and engineering as:
- Fabrication (make up results), falsification (changing/misrepresenting), plagiarism (representing other's work/ideas as own), or other serious deviation from accepted practices in proposing, carrying out, or reporting results from activities funded by NSF, or retaliation of any kind against a person who reported or provided information about suspected or alleged misconduct and who has not acted in bad faith
- “Fraud” - Gross versions of above

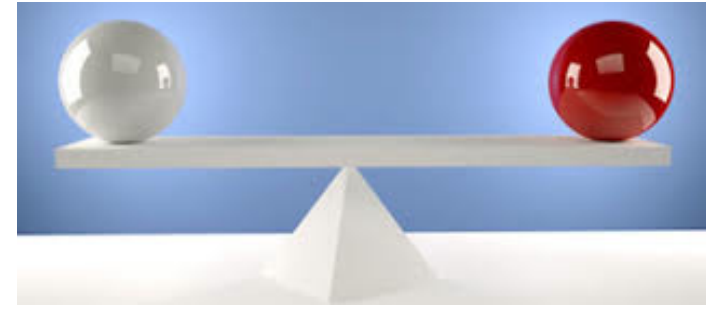


Babbage's Four Types of Deception and Fraud in Research

- **Forging:** deception intended to establish one's reputation
- **Hoaxing:** deception intended to last only for a while and then to be uncovered or disclosed, typically to ridicule those who were taken in by it
- **Trimming:** selectively omitting bits of outlying data
- **Cooking:** selective reporting of results (e.g., only good cases), falsifying data, massaging data in the direction that supports the result one prefers



Bias and Self-Deception



- Rush to report results before peer-review (e.g., cold fusion case) results in self-deception
- Conflicts of interest (cause bias)
 - Own large shares of stock in company doing research for
 - If promise of more research funding if results favor the products of the company
 - Fund research to show product is better than another (when it is not)



Protecting Research Subjects

- Human subjects in automotive research, biomedical research
- Experiments on humans only permissible after obtaining **voluntary consent** of the human subjects (they must have all information on risks, possible benefits); there can be no coercion to be a subject or to do something





US Law: Human subjects must receive



- The purpose of the experiment and procedures to be used
- Foreseeable risks and discomforts
- Foreseeable benefits
- Appropriate alternatives, if any
- The extent of confidentiality of the test results
- The availability of medical treatment for any injury received in the experiment, and compensation for any disability
- Whom to contact in case of questions, and
- Assurance that participation is voluntary and that neither refusal to participate nor later withdrawal from the study will result in loss of benefits to which the person is otherwise entitled (such as future care at the same facility)



- Institutional Review Board (IRB)
 - Protection of human subjects
 - Reviews research protocols of all experiments involving humans
 - Detailed guidelines must be met before experiment can be conducted
- Human subjects in product testing
 - If do not get federal funds, not subject to regulations
 - But, bound by standard engineering ethics



Experiments on Animals: To Benefit Humans



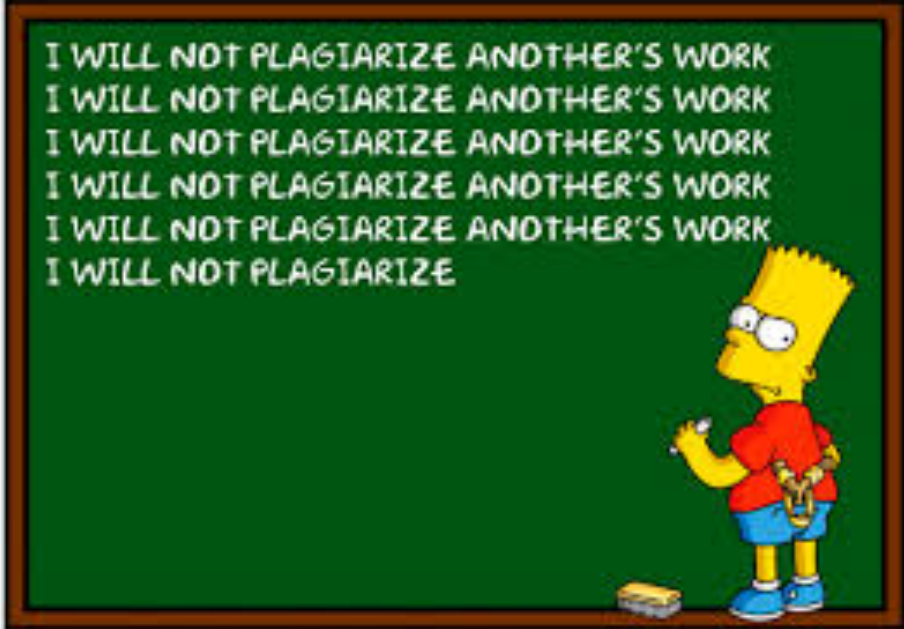
- What species to use? Mammals?
- Does intelligence level of animal matter?
Bacteria vs primates?
- What about animals with complex social systems? (suffering of one animal adversely affects others in its group)
- What about human pets?
- In University research, regulatory boards (e.g., for vertebrates)



If you cut and paste it from the web, he'll say you plagiarized.



I didn't cut and paste it. I printed it and then typed it in. Is that plagiarism? I mean, I typed it.





Giving and Claiming Credit



- **Plagiarism:** intentionally or negligently submitting others' work as one's own
- **Failure to give credit:**
 - NSPE BER Case No. 92-1: A city hires an engineer to design a bridge, and the engineer in turn subcontracts some key design work to a second engineer. Months after the bridge is completed, the first engineer submits the design to a national design competition where it wins an award, but he fails to credit the work of the second engineer.



Citations

- “Give credit where credit is due”. But, you have to figure out where it is due!
- Clarify what you have contributed and what you have not (allows you to “stake a claim”)
- Must be specific about what is in others’ papers, and how it relates; highlight the most similar work
- Who does what first matters! (e.g., in terms of getting your degree)





- **Misrepresenting credentials:** saying you have a degree that you do not have (perhaps you completed only part of the course work)
- **Misleading listing of authorship:**
 - Order of authors in engineering is the greatest contributor to the least contributor
 - Omitting a co-author, misordering
 - Adding an author who has nothing to do with the paper
- **Use of acknowledgements section**
- **Rules of journal or conference**
- **Reporting misconduct:** It is your responsibility to report misconduct you see



Reviewing a Paper

- Conference (2-3 people) vs journal (3-4 people) (different standards)
- Opportunity to learn (good and bad papers)
- Important to **fairly evaluate**, especially with respect to literature (if can't do that say so)
- May conduct a simulation, check a proof
- Important: Contents of the paper are confidential (no sharing whatsoever); if talk to advisor to get help in reviewing then you and s/he should both be listed as reviewers. Cannot use any of the results!



Consulting Engineers

- **Deceptive advertising:**
 - Outright lies
 - Half-truths (e.g., saying part of big projects that only had a minor role in)
 - Exaggeration (of the quality of past products)
 - False innuendos, suggestions, or implications
 - Obfuscation created by ambiguity, vagueness, or incoherence
- **Competitive bidding:** Used to not allow since then you would only rely on reputation and proven qualifications





Contingency Fees

- **NSPE Code of Ethics:** Engineers shall not request, propose, or accept a commission on a contingent basis under circumstances in which their judgement may be compromised.
- Contingency fee depends on a special condition beyond the performance of satisfactory work (e.g., that you will save the client money – this may lead to inferior design in use of low-cost materials)



Safety and Client Needs

- Consulting engineers have the option to accept “design-only” projects
- Problems:
 - No follow through with the client to monitor how the project is going
 - No monitoring of safety issues that unexpectedly arise

DOCTOR FUN presents 1991

#1991-085



During the course of the trial, both sides had ample opportunity to call upon their expert witnesses.



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Expert Witnesses and Advisors

- Expert witnesses in the courts:
 - May be hired by plaintiff or defense
 - Give testimony on defective products, personal injury, property damage, traffic accidents, airplane crashes
 - Ok for engineers to follow how lawyers do and have an adversarial role on either side? (i.e. only try to argue for one side) Both sides then hire experts!
 - No. Engineer's primary responsibility is to be objective!



- The role of expert witnesses is to identify the truth about causes of accidents, not to directly serve attorney's clients.
- Attorneys hire and pay engineers for their services in impartially investigating the truth.
- Engineers should not become “hired guns” who engage in outright lies and distortions according to who pays their consulting fee.



- Abuses:
 - Hired guns
 - Financial biases: Being paid by one side can exert some bias (should never get hired based on a contingency fee – paid only if win the case)
 - Ego biases: Adversarial situations evoke competitive attitudes that influence judgement
 - Sympathy biases: Let judgement be influenced by victims



Advisers in Planning and Policy-Making

- Example: Engineers hired by pronuclear corporations or antinuclear groups invariably feel pressure to accent one side of the case
- Assumptions made matter (they can bias solutions)
- Studying only part of the problem can create a biased solution (unfairly so)



- Hired guns: Engineers should not do this
- Value-neutral analysts: Engineers are completely impartial. Avoid taint of bias, favoritism, and advocacy
- Value-guided advocates: May adopt partisan views in controversial issues but remain honest and independent in their professional judgement – make their responsibility to the public paramount



Sources

- Some of the points in these slides came from:
 1. Caroline Whitbeck, *Ethics in Engineering Practice and Research*, Cambridge Univ. Press, NY, 2011
 2. “PhD Research: Elements of Excellence,” Prof. Ness B. Shroff, Dept. Electrical and Computer Engineering, The Ohio State University



View Check Question

- **Suppose you have worked with your advisor for 2 years, you write a paper without her/his explicit help. Should you put her/his name on it?**