



**Ethics in  
Electrical and Computer Engineering**

**Lecture #9: Engineer's Responsibilities and  
Rights**

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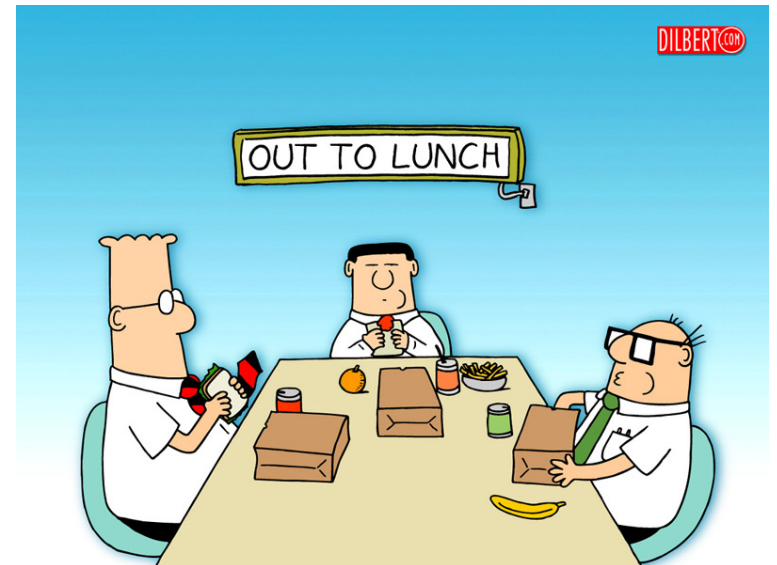


# Professionalism at the workplace...

- Professionalism at work involves competence, a sense of fun and excitement, good conduct, and personal commitments
- Engineer' s main responsibility: Top performance and professionalism
- What are the key issues at work?
- Some things matter, some do not? Which ones? Many different perspectives...
- **Example:** Dress code?
- **Example:** Office space/decor “code”? Tech-inspire

# Teamwork

- **Ethical corporate climate:**
    - Ethical values in full complexity are acknowledged
    - Responsibilities to constituencies affirmed (other teams, departments, administration, clients/customers)
    - Ethical language is acceptable (you can say what you think is right and wrong)
    - Management (you?) sets moral tone in words, policies, and personal examples, and each person does too.
    - **Examples:** Lunch/break lengths, work diligence, time sheets
    - **Procedures for conflict resolution in teams are important**
- Ethics is not just doing what makes the company money!





- **Loyalty and collegiality:**
  - **Example:** Acceptance of job offer, what do you owe the company? Can you interview? Take another offer?
  - As an employee, fulfill contractual duties to employer (get the job done to your best abilities)
  - **Example:** Has corporate loyalty to employees degraded? How easily can you get fired if you are performing well? Does this imply that your loyalty should degrade? Creates a bad tone!
  - Attitude (collegiality)
    - Willingly seek to perform duties
    - Enthusiastic, not “forced”
    - Closely related to loyalty
    - Over long time periods good attitude can be difficult to maintain

- **Managers and engineers**



- Respect authority, but...
- Your demands for professionalism, and appropriate professional tone set by the boss and in the workplace, are important!
- **Example:** Porn in the workplace
- Expert authority is important, a key aspect of professionalism, and something that should be respected (even if someone is not your boss)
- **“Company-orientation”** (engineering, customer, finances, marketing). What *mix* is best? You may decide this if you are the boss.
- How does the company manage conflict? Managers? Ombudsperson? Organizational structures?



# Confidentiality and Conflict of Interest

- **Confidentiality**
  - What to keep secret?
  - “Proprietary information” - disclosure to competitors would hurt the company. The company has a right to some secrets.
  - What about a right to secrecy about poor practice, unethical policies and practices, etc.?
- **Changing jobs:**
  - Confidentiality to old employer does not cease!
  - But, there is a *soft boundary* as you always bring along your expertise and experiences (i.e., your brain)!



- **Management policies?**
  - Mark documents as “proprietary”?! Make clear statements about what is and is not confidential.
  - “Employment contracts”
    - Have you signed one?
    - Did you read the fine print?
    - **Example:** Do you own work that you do at home at night on unrelated projects?
- **Clear policies are critical!** They help set a professional tone since they set clear boundaries. *Everyone then knows what is right or wrong.*



# Conflicts of Interest

- Situations that if pursued could keep employees from meeting obligations to employer:
  - Gifts, bribes, kickbacks? Have you done this? Is it always unacceptable? When/where is it acceptable?
  - Interests in other companies (suppliers?)
  - Insider information (impact on stocks)





# Rights of Engineers

- Professional rights
  - Right of professional conscience (moral autonomy)
  - Right of conscientious refusal (can refuse to be unethical just because you view it to be that way)
  - Right to recognition, fair pay



# Employee rights...

- Privacy (e.g., in computers). To what extent can the company pry?
- **Equal opportunity, nondiscrimination, sexual harassment, affirmative action**
  - Have you seen discrimination in the workplace?
  - Have you seen sexual harassment in the workplace?
- What should you do about it? Just because you see it, are you responsible?
- **Examples:** Should you date co-workers? Is it a good idea to date the boss?



## “Groupthink” (Harris et al.)

- Only within-group discussions, form a “parochial” perspective (for technology, ethical and social justice issues)
  - Illusions of invulnerability (we can do no wrong)
  - Illusion of morality (in group, view all as ok)
  - Self-censorship (only within group)
  - Illusion of unanimity (dissent perhaps not allowed)
  - “Mind-guarding” (not letting in outside views)
- Need dissent, diversity, outside surveys/  
market research/critical evaluations



# Whistle-Blowing

- What is whistle-blowing?
- Disclosure by employee outside approved channels, to group that may take action
- Topic is a significant moral problem (e.g, public safety)
- **Examples:** Ernest Fitzgerald and the C-5A, Dan Applegate and the DC-10 (see the book)... here, consider the Virginia Edgerton phone/police car case...



# Computers and Police Cars

## (S. Unger)

- Virginia Edgerton worked as a system analyst for the New York City Police Department in 1977, when the department was implementing a new computer system called PROMIS. Edgerton was on the PROMIS team, and when she learned that the system was going to be installed on the same server that ran SPRINT, an online police car dispatching system, she questioned whether this should be done before investigating whether running both systems on the same server would impact the SPRINT response time. Her supervisor did not give her concern any weight and proceeded with the project. Edgerton went to IEEE for advice and support in resolving this potential safety issue. **Did she do the right thing?**



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# Moral guidelines for whistle-blowing...

- “Permissible and obligatory” if:
  - Actual or potential harm is serious
  - Harm is documented
  - Concerns have been reported to superiors
  - Do not get satisfaction, explore all other organizational channels to the top
  - Reasonable hope that whistle-blowing will help prevent or remedy the harm
  - **Example:** Challenger case
- **But, specific cases raise problems with such guidelines**





## Commonsense procedures...

1. Except in rare emergency, work through channels
2. Know the rules for making appeals
3. Be prompt in objecting
4. Be tactful, low-key, avoid getting emotional (stay professional, focus on objective issues)
5. Be considerate of feelings, avoid personal criticisms





## Additional commonsense approaches...

1. Keep supervisors informed (discussions and memos)
2. Be accurate, document
3. Consult trusted colleagues
4. Before going outside, consult ethics committee of professional society
5. Consult a lawyer



# Bay Area Rapid Transit (BART) System

- Links San Francisco with cities across the bay
- Built with tax funds
- Had tremendous cost overruns and delays – attributed to introduction of innovative methods of communicating with individual trains and controlling them automatically



- Plain fail-safe operation was replaced by complex redundancy schemes
  - Fail-safe systems have a train stop if something breaks down
  - Redundancy tries to keep trains running by switching faulted components to alternate ones
- Opportunity to build rail system from scratch, unfettered by old technology



- Engineers felt that too much experimentation was done without safeguards
- Three engineers: H. Hjortsvang, R. Bruder, M. Blankenzee identified dangers only recognized by management much later
  - Unsafe automatic train control
  - Testing it and operator training inadequate
  - Computer software problems pervasive
  - Insufficient monitoring of contractors



- The three engineers wrote a number of memos and voiced their concerns to their employers and colleagues (even though none of them were not specifically assigned to the safety of the automatic control system)
- Hjortsvang wrote an anonymous memo summarizing the problems and distributed it to nearly all levels of management



- Memo argued for a new systems engineering dept.
- Management felt that the memo was suspicious and unprofessional (being unsigned) since done outside normal channels of accountability
- Management felt that Hjortsvang wanted to be the manager of the new dept.



- The three engineers contacted members of BART's board of directors when their concerns were not taken seriously by lower levels of management
- Management perspective on this was that they acted improperly since not an approved organizational channel
- To get independent view, the engineers contacted a private engineering consultant



- One BART director, D. Helix, listened and agreed to contact top management while keeping the engineer's names confidential
- Helix released unsigned engineer's memos and the consultant report to local newspapers
- Management sought to locate source of Helix's information. Engineers lied about their involvement





- At Helix' s request engineers later agreed to reveal themselves by going in front of board of directors to try to remedy safety problems
- But they were unable to convince the board of those problems



- Engineers were given the option of resigning or being fired (for insubordination, incompetence, lying to superiors, causing staff disruptions, failing to follow understood organizational procedures)
- Subsequent studies proved the safety judgements of the engineers were sound (changes in automatic train control were made)



- Engineers sued BART (settled out of court)
- IEEE filed a “friend of the court” document noting in the engineer’s defense the engineer’s professional duty to promote the public welfare as stated in IEEE’s code of ethics



- Do you agree with the following observations, and do you have others?:
  - Engineers should have been better-prepared to present their case before the board of directors (they needed to be able to absolutely convince them that there were safety problems)
  - Should not have sent an unsigned memo to all levels of management (should have informed boss and sent signed memo, then if not satisfied justified to go to board of directors)



# Attendance Question

- **For those of you who have had an engineering job, describe unprofessional behavior you have seen in the workplace.**
  - Do not use names of people/companies
  - **Save descriptions of discrimination and women's issues for the end of the next lecture**
  - I reserve the right to publicly speak/write about the cases and will not pursue cases. This is only for education!
  - Can put your name on a different sheet

**Please:** Put your name on the sheet of paper and turn it in...