EECS 159A/CSE 181A Professionalism, Ethics, and Legal Responsibilities

Outline

- Professionalism
  - Competency, Integrity, and Respect
- Ethics
  - Cost-benefit analysis
- Legal responsibilities
  - Law compliance vs. ethical obligations

Professionalism

Definition

- Professionalism
  - “the conduct, aims, or qualities that characterize or mark a profession or a professional person”
- Profession
  - “a calling requiring specialized knowledge and often long and intensive academic preparation”

Elements of Professionalism

- Competency
  - Specialized knowledge, get the job done, problem solving
  - Lifelong learning!
  - Use proper tools
- Integrity
  - Honesty, Accountability, keep their words, do not over promise,
  - Take responsibility, give credit when due
- Respect, Self-regulation, Image
  - be humble, willing to learn
  - behave under pressure, no snapping back
  - polite, neat, polished, use proper language, not sloppy

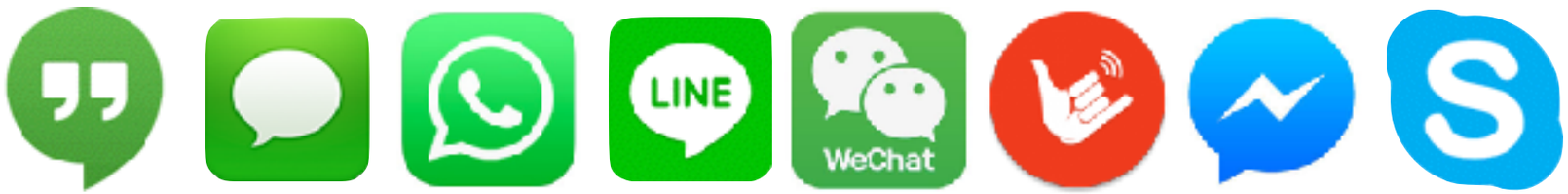
Tools

- Team Communication
  - email, instant messaging, social networks, video conference
- File Sharing
  - FTP servers, cloud drives
- Collaborative Authoring
  - Cloud apps, version control
- Project Tracking
  - Gantt chart, case tracker, shared calendars

You can always Email, but…

- Email can be used for most purposes
  - Team communication, file sharing, ..
- Email is often NOT the best way
  - **Pushes** data to recipient
  - Lacks structure (e.g., where to put what files)
  - Stale copies of data (attachments)
  - Re-interpret to reconstruct state of project
  - Easy to misunderstand and miscommunication

Instant Messaging

- Examples 
  - Google hangout, SMS, iMessage, WhatsApp, Line, WeChat, FireChat, Facebook Messenger, Skype, and many more…
- Pros & Cons
  - More interactive than email
  - Dialog-centric, rather than message-centric
  - May still have stale & re-interpretation problem

Social Networks

- Content by user + controlled sharing
  - Organized as “news feed” on a “wall”
  - Sharing based on membership (“friends”)
    - Content can be original, shared link, likes, on-line games
- Examples
  - Facebook, Twitter, Google+, Slack, MeetMe, Pinterest, ..

Facebook, Twitter

- Facebook
  - Team members friend each other to share thoughts & links
  - Project itself can have an account as team website
  - Supports instant messaging
- Twitter
  - Good for broadcasting short, instant update (tweets)
  - Good for following “what is trending”
  - @user, #topic tag
- Issue: mixing personal stuff with work

Google+

- Displays feeds & allows easy posts
- Distinguish connections
  - e.g., friends, family, acquaintances, followee, plus custom
    - Can separate work from personal stuff
    - Good idea but can be high overhead each post
      => may be easier to just use separate accounts
- + a post to add to the like-count
  - mechanism for social ranking of content

Team Communication

- Slack

  - Concept of teams and users
  - Team can have channels (e.g., #app, #hardware)
    - users can opt-in/out of channels
- Glip

  - text or video chat
  - team calendar for scheduling
  - shared storage, external integration

Meeting in Person

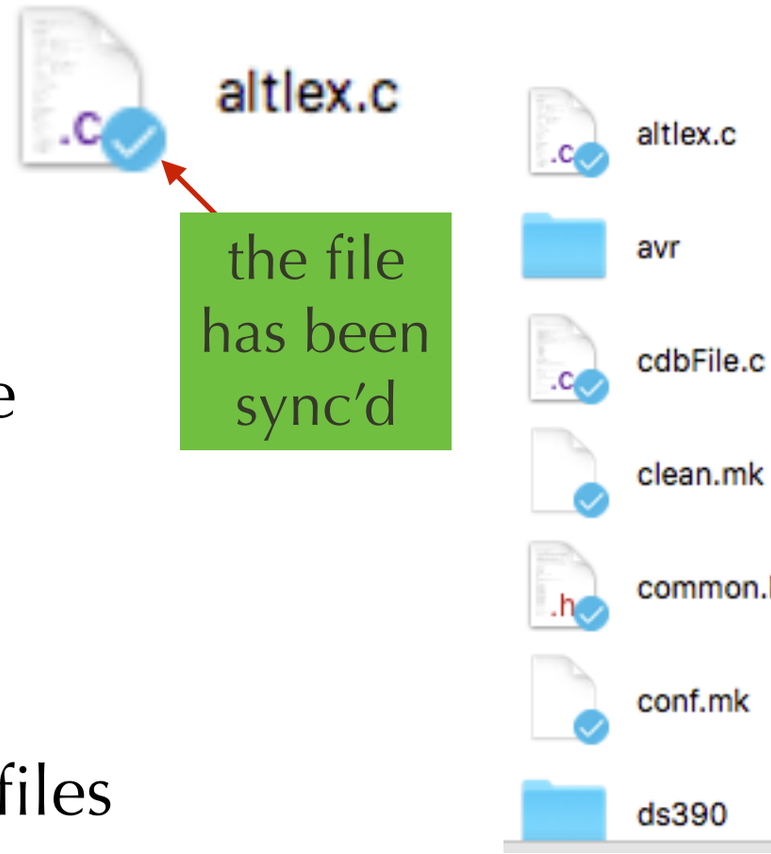
- Usually a good idea!
  - Direct communication is often efficient
  - Can show tangible things, not just text
  - Better if everyone is prepared up front
- Video conferencing
  - Useful when hard to find common time to meet
  - Most IM include video & audio conference
  - Google Hangout: multi-way, share screen

File Sharing

- FTP Servers
  - File-transfer protocol server to a file system
  - Every team member makes a local copy that can be automatically synchronized
- Cloud Storage
  -  Dropbox,  Google Drive,
  -  Box,  Microsoft OneDrive,
  -  Amazon Cloud Drive

Issues with Cloud Drives

- Advantages
  - Local files automatically sync'd to cloud
  - Automatic backup, available when online
  - Multiple users can access the same drive



- Disadvantages
  - Multiple users could try to edit the same files
    => can overwrite each other's changes
  - Logged into at most one account per service at a time (e.g., Google drives for UCI account and personal account — can't mount both via the same plug-in)
  - Can't sync just some folders — need to sync entire account!

odrive: middleware for Cloud Storage

- Unifies all your cloud storage accounts
  - add one or more Dropbox, GoogleDrive, OneDrive, SFTP, … accounts
  - Use multiple accounts transparently
    - Pop-up menu to share web link to file
- Ability to “unsync”
  - Remove unused copy from your local drive — just keep reference (with .cloudx suffix)
  - Saves space on local drive, sync on demand

Collaborative Authoring

- Cloud storage with local app
  - example: MS Office, iWorks
  - problem: at most one person should edit a file at a time
- Cloud App
  - edit-online together, online merge
  - example: Google Apps (word, slides, sheets), Invision, Murally, GoVisually, RedPen, GroupZap,
  - problem: can’t work offline

See also: http://www.creativebloq.com/design/online-collaboration-tools-912855

Version Control

- examples:
  - RCS, CVS, SVN, GIT, …
- Purposes
  - Prevent overwriting other's changes
  - Allows offline, concurrent editing
  - auto merge (source code changes)

Version control example: GIT

- Popular version control system
  - Repositories: keeps all versions of submitted files
  - Server: hosts repository
- Supported features
  - Locally saving a snapshot (commit)
  - Submitting a version remotely to repository (push)
  - Downloading changes made by others (pull)
  - Automatic merging changes

Basic Git Commands

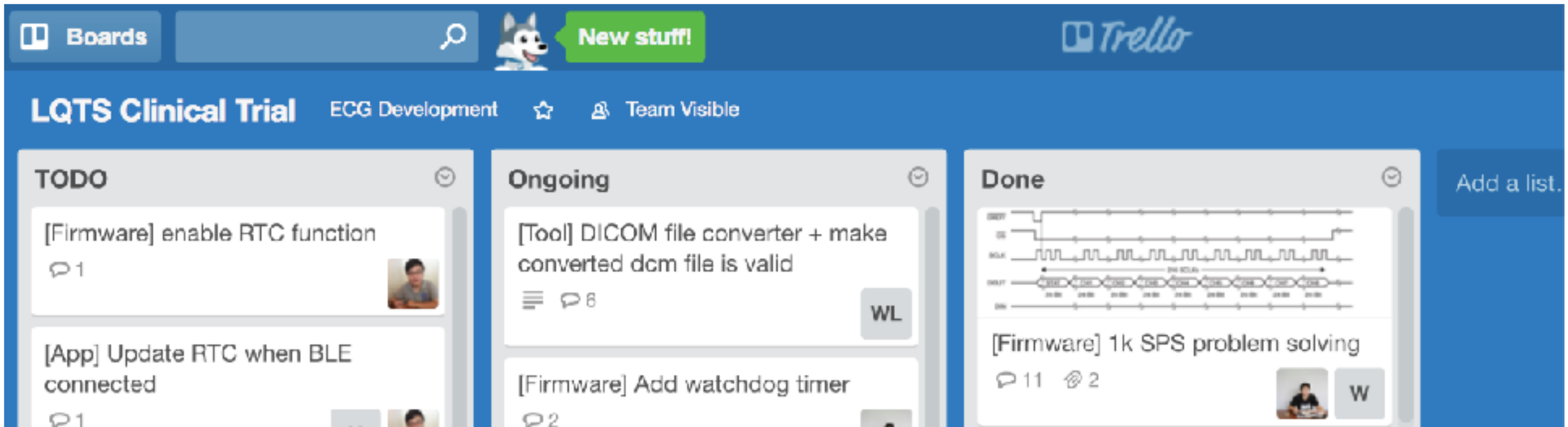
- Setting up repository
  - Create README file, git **init** directory, push
- Team member makes their local copy
  - git **clone** <gitpath> (over http or ssh)
- File Maintenance
  - git **pull** (download changes from repository & merge)
  - git **commit** <files> -m <msg> (take local snapshot)
  - git **commit** -**a**m <msg> (snapshot of all changed local files)
  - git **push** (upload your changes to repository)
  - git **rm** <files> (remove file from tracked files)
  - git **add** <files> (add files to the tracked file list)

Comparison of version control systems

	tracks	access mode	auto merge	primitives
RCS	file version	local only	no	check-in, check-out
CVS	file version	local or remote	yes	commit, update
SVN	project snapshot	local or remote	yes	commit, update
GIT	project snapshot	local and remote	yes	commit, push, pull

Shared Task Boards

- Example: Trello
  - Concept of a “board”, user can add list
  - A list can have cards = basic unit
  - Card can have details, discussion, attachment
  - Example lists: To do, ongoing, completed
  - Other task boards: Restyaboard, Wekan, TaskBoard



Shared To-Do Task Managers

- Examples
  - WunderList, Todoist, Things, Doit.im, Nirvana, Producteev, Remember The Milk, Toodledo, Trac, ProofHub, ...
- Purpose
  - Help you track the action items for your team
  - Comment at task level

Project Tracking and Management Tools

- Collaboration support
  - Samepage, Quire, MOOVIA, Asana, Producteev, Redmine, ...
- Common features
  - private social network, integrates communication, task tracking (Gantt Chart), file sharing, calendar, pinned items, comments
  - https://vimeo.com/62744128

Ethics

Case Study: Ford Pinto

- Compact 2-door car
- Design began in 1968
  - under direction of Lee Iacocca
- Produced 1971-1980
- Sold for $2000 new

Design Flaw

- Flaw in fuel tank placement & flimsy bumper
  - Fuel tank in the back near the bumper
  - Potential explosion during collision
    - tank would be thrust forward into the differential
    - protruding bolts on differential would puncture tank
- Door could jam during accident
  - poor reinforcement

Accidents

- 5/28/72 From Anaheim to Barstow on CA-30
  - Pinto stalled in middle lane
  - rear-ended at 28 mph by a Ford Galaxy
  - bursted into flame, killing adult driver, severely burned 13-y/o passenger, scarred for life
- Lawsuit
  - Orange County jury awarded victims $128m
- Many other incidents of Pinto explosion

Ford Reaction

- Ford eventually recalled all Pintos
  - make safety improvements
  - costed $11/car
- Article in *Mother Jones* magazine (1977)
  - published internal Ford memos discussing cost-benefit analysis

"Pinto Memo" cost-benefit analysis

- Expected Costs **with** fuel tank modifications:
  - Expected unit sales: 11 million vehicles
  - Modification costs per unit: $11.00
  - Total Cost: $121 million
- Expected Costs **without** fuel tank modifications:
  - Expected accident results*
    180 burn deaths
    180 serious burn injuries
    2100 burned out vehicles
  - Unit costs of accident: **
    $200,000 / burn death +
    $67,000 / serious injury +
    $700 / burned vehicle
  - Total Cost: $49.53 million

* assuming 2100 accidents
** assuming out of court settlements
+ "Cost to society estimated by National Highway Administration

Law vs. Ethics

- Ford did not break any laws
  - Pinto design satisfied all legal safety requirements at the time
  - Even the cost-benefit analysis was lawful
- So, did Ford do anything wrong?
  - Which part of Ford? Engineers? Management?
  - Would it make a difference to know that Ford successfully lobbied the US Government not to impose stricter safety requirements?

IEEE Code of Ethics

- We, the members of the IEEE, in recognition of the importance of our technologies in affecting the quality of life throughout the world, and in accepting a personal obligation to our profession, its members and the communities we serve, do hereby commit ourselves to the **highest ethical and professional conduct** and agree:

IEEE Code of Ethics (1/2)

1. to accept responsibility in making decisions consistent with the **safety, health, and welfare** of the public, and to disclose promptly factors that might endanger the public or the environment;

2. to avoid real or perceived **conflicts of interest** whenever possible, and to disclose them to affected parties when they do exist;

3. to be **honest and realistic** in stating claims or estimates based on available data;

4. to **reject bribery** in all its forms;

5. to improve the understanding of technology; its appropriate application, and potential consequences;

IEEE Code of Ethics (2/2)

6. to maintain and improve our **technical competence** and to undertake technological tasks for others only if qualified by training or experience, or after full disclosure of pertinent limitations;

7. to seek, accept, and offer **honest criticism** of technical work, to acknowledge and correct errors, and to **credit properly the contributions of others**;

8. to **treat fairly** all persons and to not engage in acts of discrimination based on race, religion, gender, disability, age, national origin, sexual orientation, gender identity, or gender expression;

9. to **avoid injuring** others, their property, reputation, or employment by false or malicious action;

10. to assist colleagues and co-workers in their professional development and to support them in following this code of ethics.

Legal Responsibilities

Legal responsibilities of an Engineer

2. to avoid real or perceived **conflicts of interest**

3. to be **honest and realistic** in stating claims

4. to **reject bribery** in all its forms;

7. … to **credit properly the contributions of others**;

8. not engage in acts of discrimination based on race, religion, gender, disability, age, national origin, sexual orientation, gender identity, or gender expression;

9. to **avoid injuring** others, their property, reputation, or employment by false or malicious action;

Conclusions

- Professionalism
  - Essential way of conduct in successful projects
  - Competence, Accountability, Maturity, Organization
    - Use of right tools can help
- Ethics
  - Self-imposed higher standard than the law
  - overrides money and interest considerations