CS 3001 Computers, Society, and Professionalism

Spring 2022

**Section Discussion Guide**

Week 3

Topics

* Therac-25

I. Go over expectations

* Class video
  + Watch/attend before discussion section
* Readings
  + Read before class (or watching video)
* Quizzes
  + End of week
* Reading Commentaries
  + Before discussion section

II. People in the Therac controversy

* Ask everyone to pick someone in the Therac controversy, making sure no two people pick the same person
* Think quietly for five minutes referring back to the paper about
  + What that person did
  + What that person failed to do
  + What they could have done differently
  + How that affected what happened
* Go around the group and discuss each person as a group
* Discuss key remaining people who were not picked, led by TA. You don’t have to discuss all of these, but continue the discussion until you feel like you have discussed key elements of the different kinds of people and all the major issues.
  + Programmer of Therac-25
  + Radiation physicists
  + Tim Still (physicist at Kennestone)
    - After first accident, contacted AECL to ask if Therac-25 could operate in electron mode without scanning to spread the beam
  + Hamilton staff who decide to add their own hardware interlocks
  + Fritz Hager (physicist in Tyler, TX)
    - worked to understand what happened
  + Frank Borger (physicist at u of chicago)
    - realizes that students entering data funny lead to hardware error on Therac 20 (but hardware interlocks prevent damage). reports to FDA
  + Operators
    - Operator in Tyler, TX remembers what she did, was able to recreate it
  + Patients
    - Kennestone patient files lawsuit against the hospital
  + Hospital management
    - Ontario Cancer Foundation is not satisfied with official response
    - Hires independent consultant
      * Consultant correctly says need hardware interlock to check turntable position
      * Forwards recommendation to AECL, who don’t comply
      * Installs the interlock on their own machine
  + AECL employees
    - quality assurance manager
    - service engineer sent to investigate Ontario problem
    - people involved with first redesign after Ontario accident
      * adding fault tolerance for one microswitch failure
      * claim '5 orders magnitude' improvement in safety
    - "hazards committee"
    - engineer who comes to Tyler, TX
      * tells them no overdoses have been reported elsewhere
    - engineers who studied 'cursor up' problem, but found no cause
    - person who wrote notice to users not to use the 'up' key, with no explanation why
      * person at FDA who rejects this as unsatisfactory
  + Lawyers in lawsuits
  + Judges in lawsuits
  + Canadian administrators at Radiation Protection Bureau (RPB)
  + Members of Therac-25 users group
  + Independent engineering consultants
    - Independent consultant hired by Ontario Cancer Foundation
    - Independent firm hired by Tyler, TX
  + FDA official
    - required only 'pre-notification' for approval of Therac, because a 'substantially similar' product was already on the market

III. First homework assignment (Assignment #1)

* TAs should ensure students have downloaded Syllabus
* Discuss the assignment
* Assignment due date

IV. Questions

* Any further questions about the class?

V. Introduce the readings for next week