Recitation 1: "We did nothing wrong"
Plan
- Introductions
- Logistics

Logistics
* Name cards
* Read the syllabus & late policy
* Do DNS readings for Thursday recitation
* Feedback! (Feedback.henrycg.com)
Introductions

1. Find a partner

2. Write down
   * Their name
   * Their favorite or least favorite computing device/app/website/concept
   * One fact about them that would be cool if it were true.
     (but that’s not necessarily true)

3. In u3 mins you’ll introduce your partner to the class.
Welcome!

Me: Henry Corrigan-Gibbs (henrycg@)
  - Relatively new to MIT
  - Focus: security, crypto, privacy
  - Call me "Henry"
  - Use he/him pronouns - please put yours on nanotag if you have preferred

Anon feedback ("any time, any reason")
  → feedback.henyrg.com

TA: Amir Farhat (amirf@)
  → Amir introduces himself

- We LOVE teaching!
- We LOVE computing!
- We hope that this course explains why!
* Read syllabus — lots of key info

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* Katrina (LaCurtis) is source of truth for all logistics–related things

* Use Piazza for all course comm.

  Less private note for sensitive things and/or special cases (illness, etc.)

* Participation is key part of grade (25%)

  Less see FAQ on site, more later

* Late policy: see website

* Questions on reading due before recitation
About recitations

- A place to discuss the readings.

- **IMPORTANT**: Do the readings before recitation starts.

- **I DO NOT** expect you to:
  * understand the papers completely,
  * have any background in these topics

- **I DO** expect you to:
  * read the papers carefully,
  * come prepared with questions,
  * participate actively in discussion,
  * give feedback (anon feedback form)

Readings

* See (optional) "How to Read a Paper" (Keshav)
* Jot down questions as you go.
* Mark confusing parts so that you can come back to them later.
Ground Rules

- Want to create a supportive & inclusive environment with words & music
- Fair allocation of bandwidth
- Try not to interrupt each other
- Critique ideas, not each other
- We are all learning... be respectful of that
- We all will make mistakes (especially me!)
  ⇒ I hope you'll be forgiving & give feedback
  ⇒ Feedback form.

Resources for your time at MIT

College is challenging & stressful in the best of times. If you need help with school or non-school, you can go to:

⇒ Katrina LaCurs
⇒ Student Support Services (SS)
⇒ Student Mental Health

x = confidential

anxious? isolated? sleeping too much?

⇒ You can always ask me if you are not sure where to go. I'll try to point you to the right place.
And now for something completely different...
What happened?

- Used 5 blocks instead of 4
- Software only supported 4,
  to draw shapes of blocks as custom
- Computer miscalculated dosage when shapes
drawn with zero-width segments

SHOW SLIDES

16 hr. days
- Overworked physicist, didn’t manually check
dosing times
- Patients got 20% - 2x more radiation than
they should have

• Staff didn’t notice that treatment
times 2x others

⇒ Would patients have had bad
counter any ways? Seems not.

SHOW SLIDES
Debate

Who is responsible here?

- Go to jail? Pay fines?

1. Multidata

2. Radiation technologists

3. Hospital administrators

4. FDA

5. No one / other?
Why?

- Tiny company (Multidata) focused on radiology
- Software has bugs — but not all bugs lead to catastrophe!
- Vulnerable population
- Overworked staff
  lack of manual checks
- Using system in unexpected ways
  5 blocks instead of 4... but supported
- Hospital didn't have software maintenance contract
  + bought cheap software... under maintained
- Poor documentation
- No warning to user when computer got unexpected input
- Multidata didn't respond to complaints about miscalculations
- FDA didn't follow up on 1998 warning letter
  + "reliant on the good intentions"
- Social factors
  + Wealthy hospital?
  + Wealthy patients
But really why?

- Use error
- Software bugs
- Business pressures
- Incentives
- Lack of $
What to do about it?

Software/Hardware

- Defense in depth ("Swiss cheese model")
  - e.g. Covid test at MIT
- Average-case inputs vs. worst-case inputs
  - Anything can be put into a system will be
  - "Computer scientist walks into a bar,..."

Human Factors

- Article blames the software but I'm not so sure...
- Legal protections / sanctions?

Physical Checks

- Dosimeter on patient (defense in depth)

→ There are ugly cost-benefit calculations that underlie all of the systems we use.

Modularity - What would it mean here?
How would it help?
Why are we reading about this mishap?

- An obvious disaster... no doubt that something went wrong.

- Beware: Computer systems are responsible for many non-obvious disasters as well...

  → examples.....

  Usually, we are many steps removed from the people whose lives our system affect.

  Think about the non-obvious disasters as well.