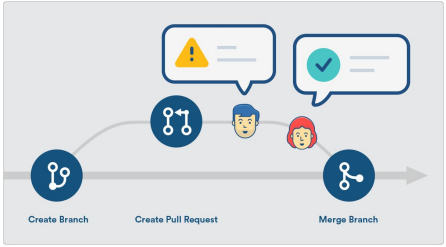
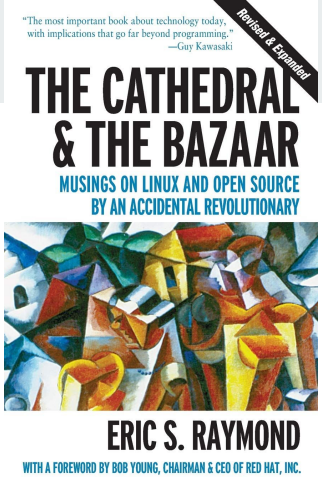
Open BioSource

HTGAA 20’ - Week 1 assignment

Goals & Rationale





- Inspired by Software Engineering - Open Source philosophy and ecosystem
- “given enough eyeballs, all bugs are shallow" (Linus’s law)
- Software bugs are analogous to risky bio workflows.
- Open vs. closed source security is a matter of active debate.
- Creators share readable code (-> workflow), the community can flag issues, and suggest practical fixes (“merges/pull requests”)
- ***Open Source Mentality*** - BioHackers should document their workflow and be open to sharing as well as accepting suggestions for improvements.
- ***Open Source Ecosystem*** - BioHackers should have access to a suite of tools that will allow comfortable recording of workflows, including detailed history of changes to the workflow, and be able to share and receive feedback.
- The goal is to prevent hazardous workflows, for the biohacker or the environment.

Design & Requirements

Principles:
- ***Reproducible***
- ***Auditable***
- ***Contributable***

1. Mentality:
   - Education - in events such as iGEM
   - Create a common language for protocols and workflows
   - Reward active community members
2. Ecosystem:

   - Electronic Lab Notebooks (ELNs) - right now there are a plethora of solutions (e.g. Benchling) yet a lot of researchers still use paper notebooks (Kwok 2018)
   - Adapting a common protocol to be used by all ELNs
   - *BioGithub* - easy access to a repository full of community-vetted workflows
   - Documenting your workflow should be easy and not add any extra labour to an already labour-full project
   - *Smart Lab* - a lab can be equipped with simple sensors that will log each machine use, thus automatically creating an almost workflow for an experiment

Assumptions & Risks

- Sharing private workflows might lead to:
  - Research Plagiarism (scooping)
  - Misuse of sensitive, dangerous biotechnology
- Only works if there's a strong active community
- Mentality cannot be implemented without the proper tools and ecosystem, and vice versa - chicken and egg.