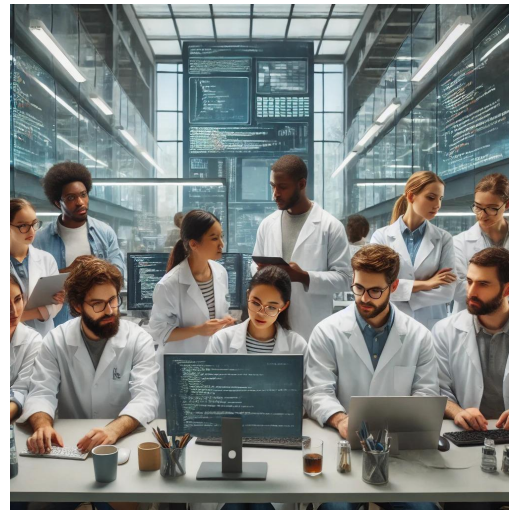
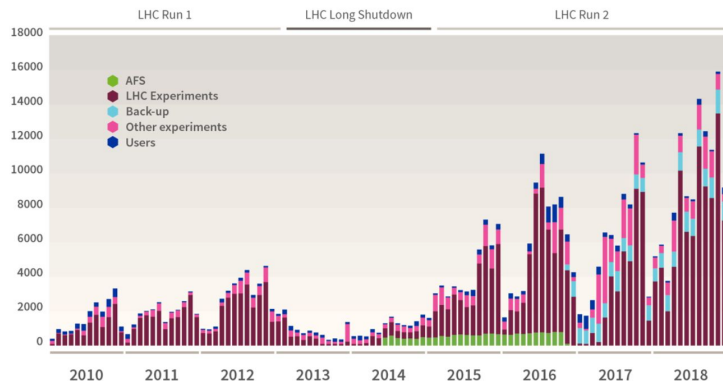


Software Engineering for Scientists (SWE4S)



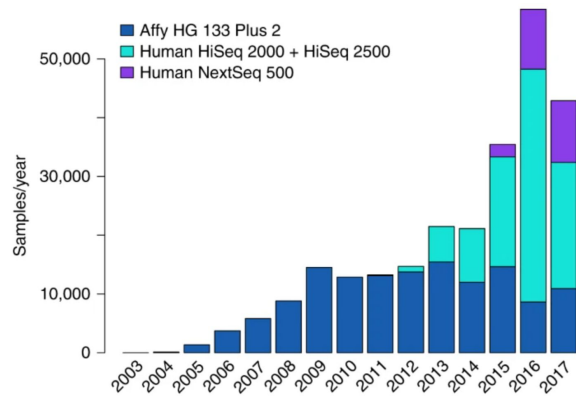
Today's plan/objectives

- Course intro/motivation
- Syllabus and logistics
- Howdies
- For next time...



Data (in terabytes) recorded on tape at CERN month-by-month. This plot shows the amount of data recorded on tape generated by the LHC experiments, other experiments, various back-ups and users. In 2018, over 115 PB of data in total (including about 88 PB of LHC data) were recorded on tape, with a record peak of 15.8 PB in November (Image: Esma Mobs/CERN)

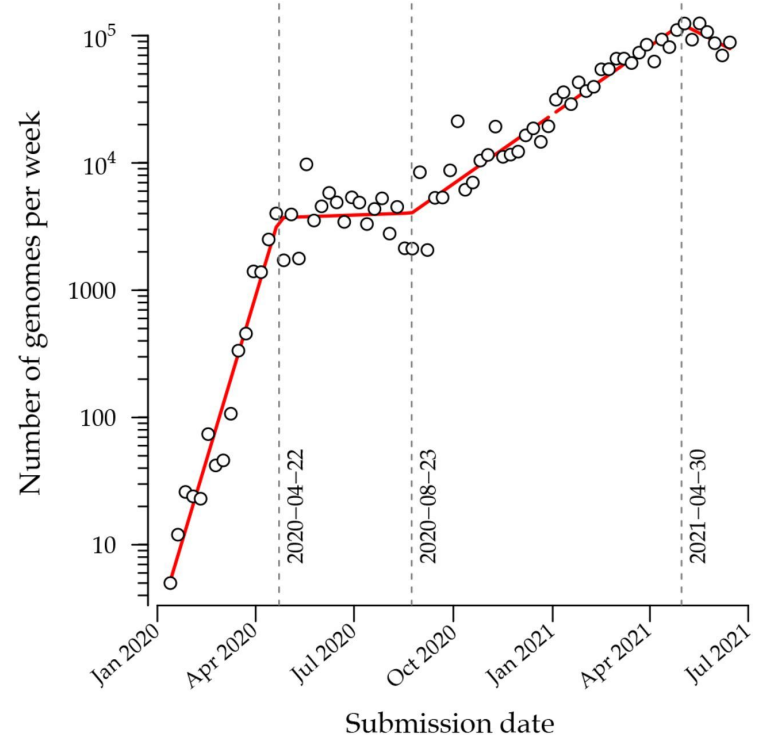
Ozcesmeci, 2019



Publicly available RNA-seq samples currently available at GEO/SRA for human and mouse compared to available samples collected with the popular Affymetrix HG UI33 Plus 2 platform

Lachmann, 2018

Science is becoming data science!



Ferreira, 2021

Computer Science 1: Starting Computing



Computer Science 2: Data Structures

Computer Systems

Discrete Structures

Software Development Methods and Tools

Principles of Programming Languages

Algorithms

Linear Algebra

Introduction to Data Science

CSCI Senior Capstone

Foundations of Software Engineering

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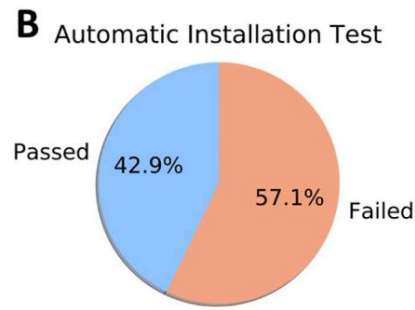
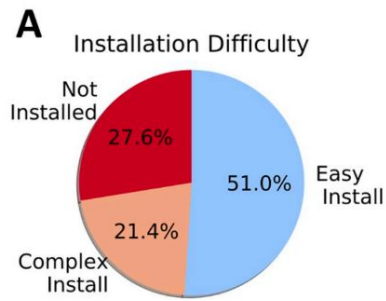
Algorithms

Linear Algebra

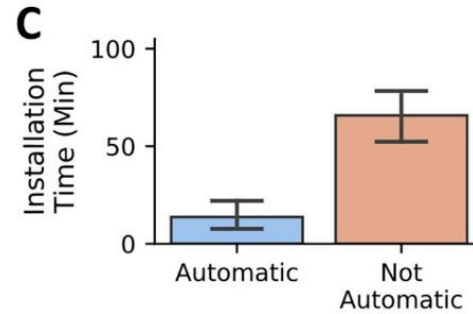
Introduction to Data Science

CSCI Senior Capstone

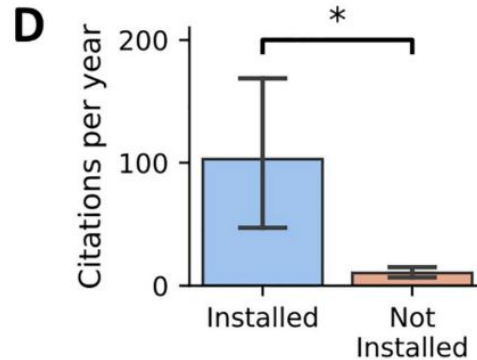
Foundations of Software Engineering



Installation is hard



and slow



and it is affects impact

A random forest-based framework for genotyping and accuracy assessment of copy number variations

Xuehan Zhuang, Rui Ye, Man-Ting So, Wai-Yee Lam, Anwarul Karim, Michelle Yu, Ngoc Diem Ngo, Stacey S Cherny, Paul Kwong-Hang Tam, Maria-Mercè Garcia-Barcelo, Clara Sze-man Tang, Pak Chung Sham

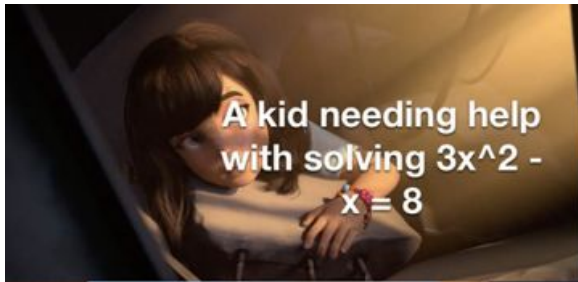
<https://github.com/sunnyzxh/CNV-JACG>

```
&showLog("Calculating het probability for $sample...");  
`/home/yerui/miniconda2/bin/perl $home/bin/Het-prob.pl -f $ref -m $snps -r $precnv -i $bam -o $outdir/$precnvbase.het.prob`;
```

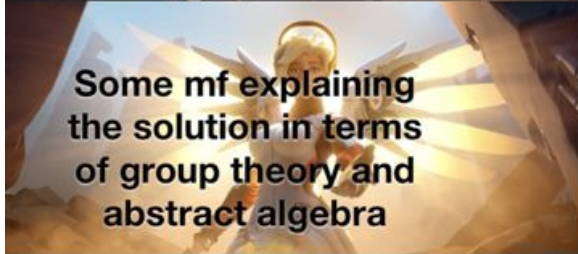

Coding best practices
Version control
Git and GitHub
Testing
Continuous integration
Code reviews
Benchmarking
Workflows
Algorithms
Data structures
Some data science
Project



SWE4S




A kid needing help
with solving $3x^2 -$
 $x = 8$



Some mf explaining
the solution in terms
of group theory and
abstract algebra

**WHEN YOU TRY TO ASK
/ANSWER A QUESTION ON
STACKOVERFLOW WITHOUT
PROPER KNOWLEDGE ON THE
FIELD BUT THEN PANIC-DELETE IT:**



Bonjour

**PEER-PRESSURE
BADGE**

Where to go for:

- Course communication and announcements: Slack
- Course notes, slides, etc.: course GitHub page
- Assignments and grades: Canvas
- Assignment submission: GitHub Classroom

<https://github.com/swe4s/lectures>

<https://canvas.colorado.edu/courses/127183>

**Erik's office hours (while I'm teaching):
T, Th 9-9:50am, JSCBB 315D**

For next time...

- Get your development environment set up
 - Refer to the notes on the course GitHub page
 - This might take some time!
 - We'll start coding on Tuesday so do this before class. If you have trouble
 - Come to office hours on Tuesday if you want help or to talk about anything
- Join the class Slack channel (via link in syllabus)
- Let me know (via Slack or office hours) if you have any questions