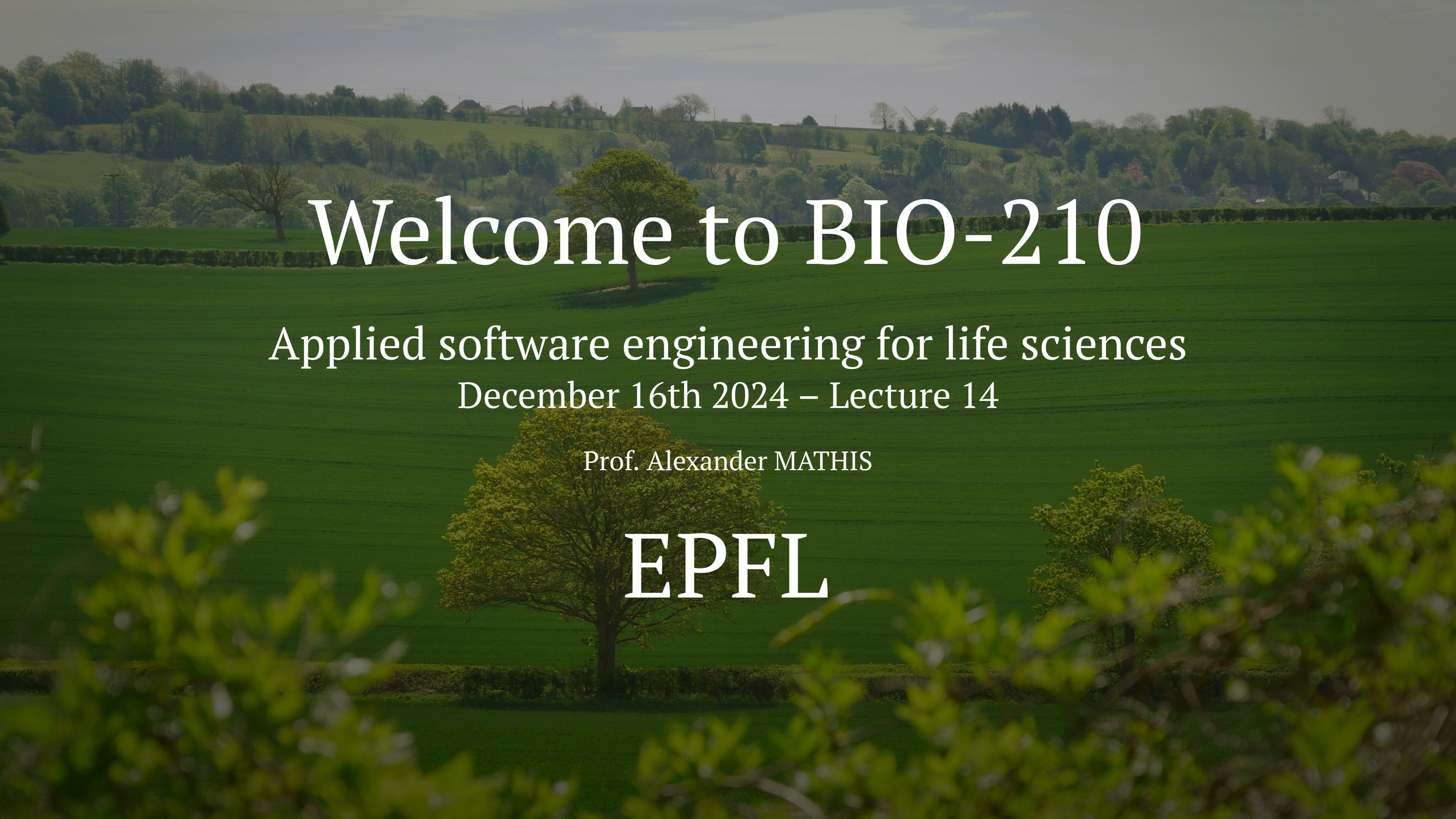


Welcome to BIO-210

Applied software engineering for life sciences

December 16th 2024 – Lecture 14

Prof. Alexander MATHIS

EPFL

	Date	Topic	Software version	Software releases	Grading / Feedback
0	09/09/2024	Python introduction I			
1	16/09/2024	Public holiday			
2	23/09/2024	Python introduction II			
3	30/09/2024	Git and GitHub (+installation VS Code)			
4	07/10/2024	Project introduction	v1		
5	14/10/2024	Functionify	v2	v1	
6	21/10/2024	EPFL fall break			
7	28/10/2024	Visualization and documentation	v3	v2	code review (API)
8	04/11/2024	Unit-tests, functional tests	v4	v3	
9	11/11/2024	Code refactoring	v5	v4	graded (tests)
10	18/11/2024	Profiling and code optimization	v6	v5	code review
11	25/11/2024	Object oriented programming	v7	v6	graded (speed)
12	02/12/2024	Model analysis and project report	v8	v7	code review (OO)
13	09/12/2024	Work on project (no lecture, but exercises)			
14	16/12/2024	Wrap up (incl. prize ceremony)		v8	graded (project)

Who won the competitions?

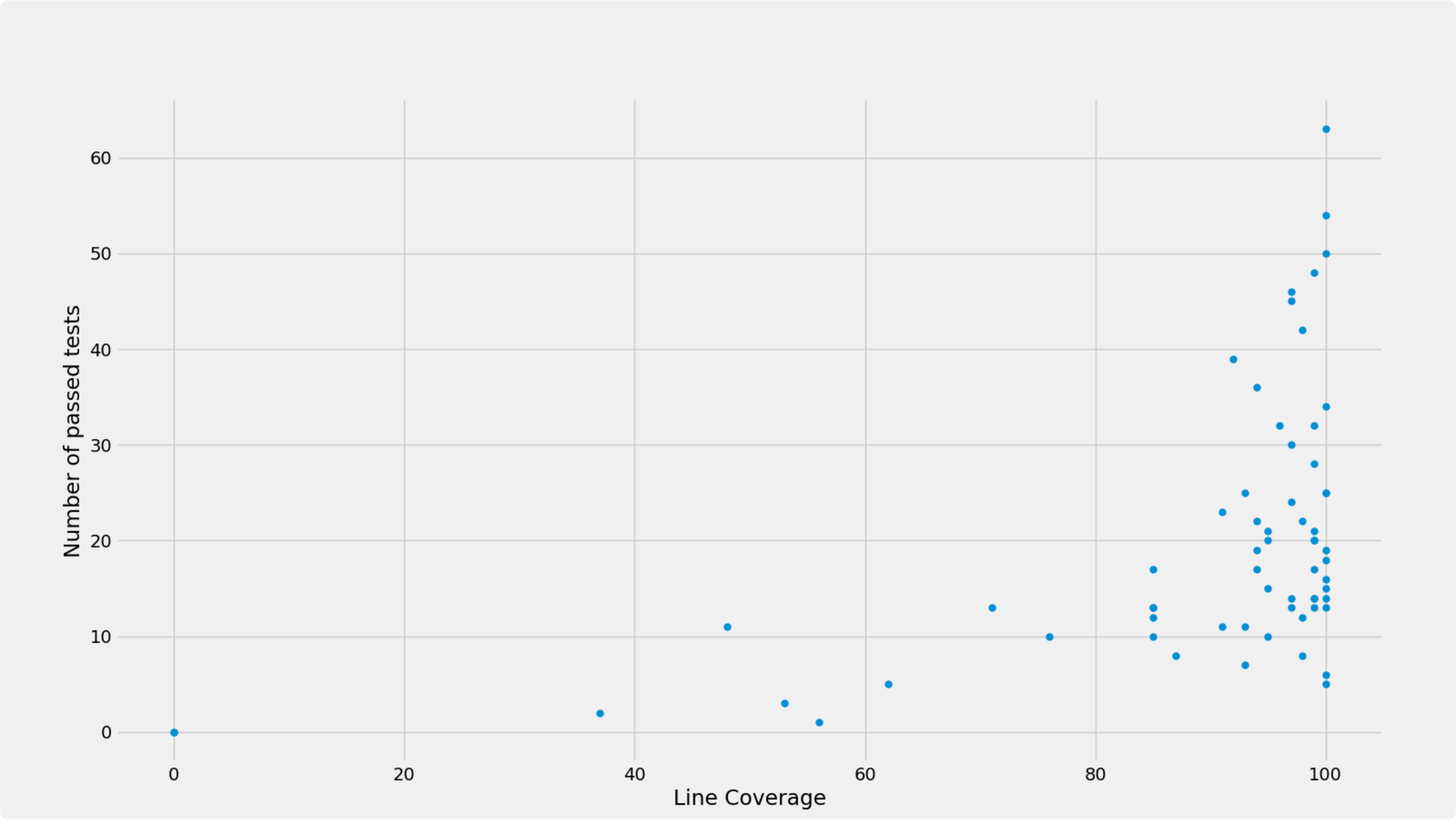
Testing: what did we look at?

- quantitative (automatic) grading: line coverage, passing prescribed tests, API correct,… (0-100)
- qualitative (manual) grading: points (0-100)
- overall score: 0-100 (mean)

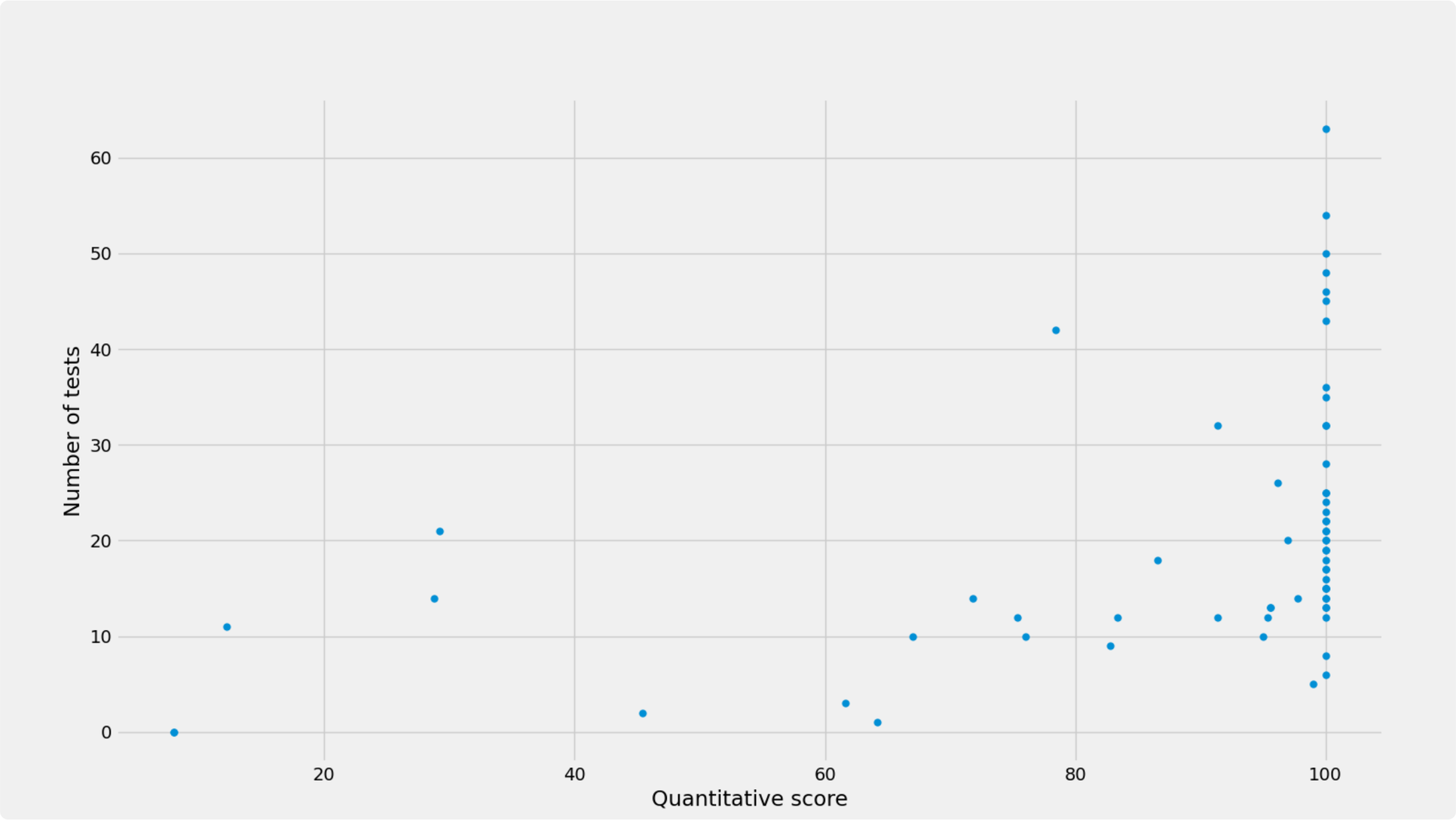
Qualitative score

- Hopfield or Turing project specific (minimum functionality that should be tested)
- Are the tests modular?
- Are the tests well commented/understandable?
- Were additional tests designed?

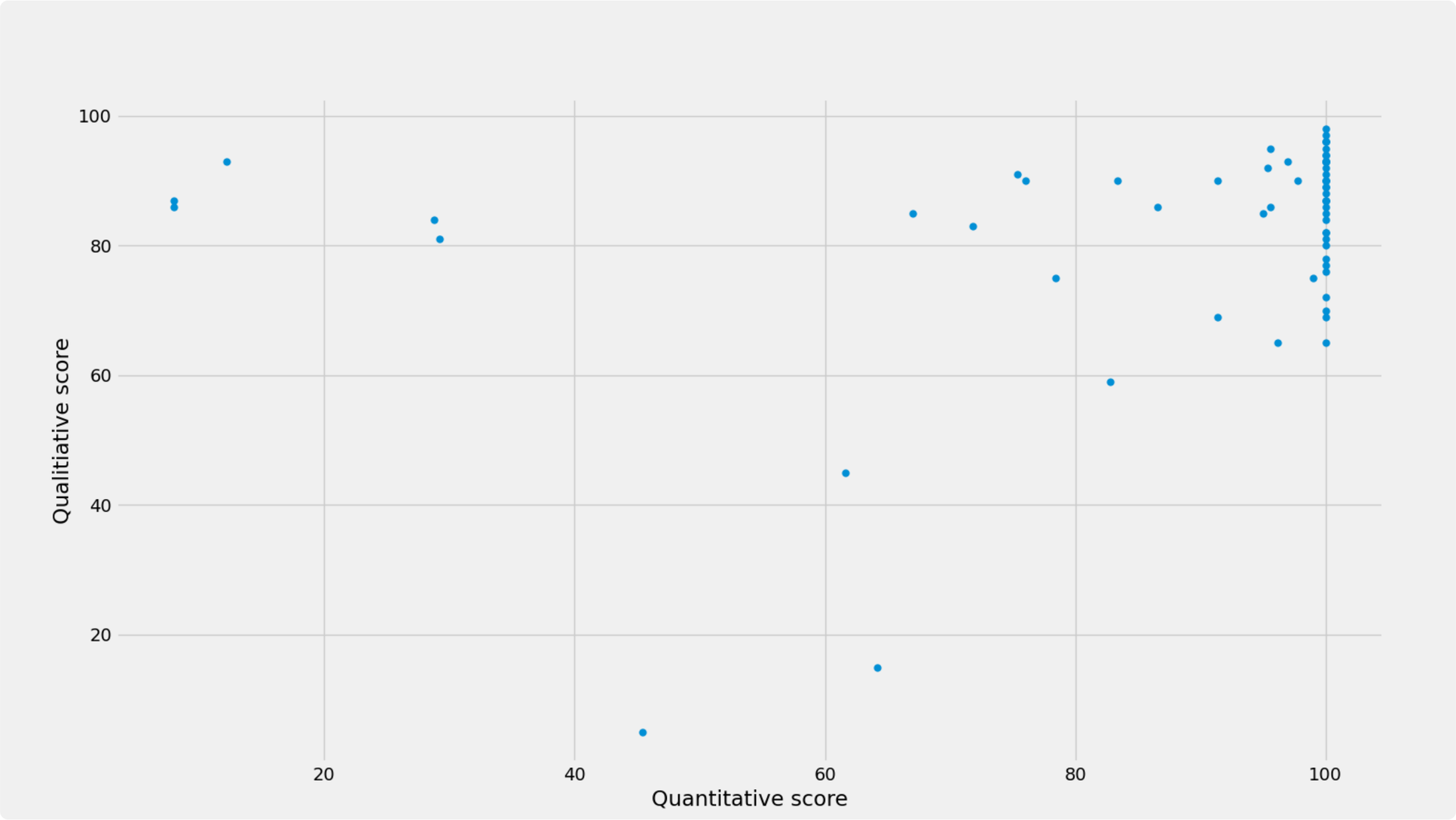
Line coverage vs. passing prescribed tests



Quantitive scores vs. number of tests



Quantitive scores vs. quality score



Who won?

Pick your favorite hoodie at the EPFL shop.

Test-suite winners: Hopfield

- Team 3: Martha Boosten, Josselin Dizerens, Jolien Van de Walle

They implemented 54 tests, which are well motivated and commented 🎉🎉🎉

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Honorable mention: Julie Delis, Christopher Perritaz, Inès Stéphan (Team 34).

Nicely structured project with cool visualizations, lots of tests (43) and high score! They also use GitHub issues for organizing their work.

Test-suite winners: Turing

- Team 6: Matteo Jasper Martignoni, Yann Aurélien Ducrest, Tuline Dachraoui

They implemented lots tests, and made them modular!

The project is very well structured, fantastic release statments (listing upgrades, breaking changes, new features, improvements, bug fixes).

Code profiling

Hopfield:

- initializing weight matrix (Hebbian and Storkey weights)
- dynamics and updating

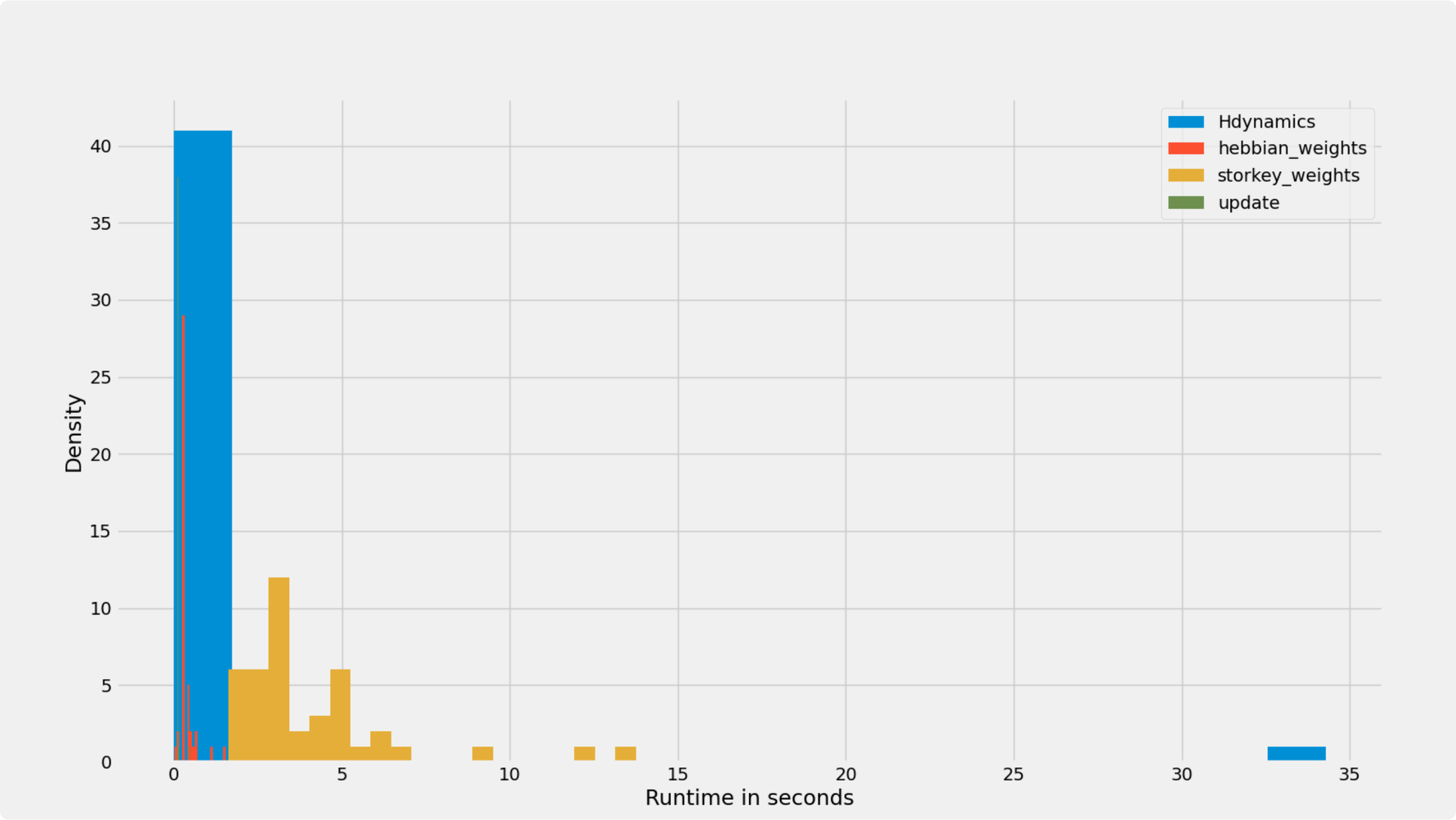
Turing:

- diffusion and updating of dynamics

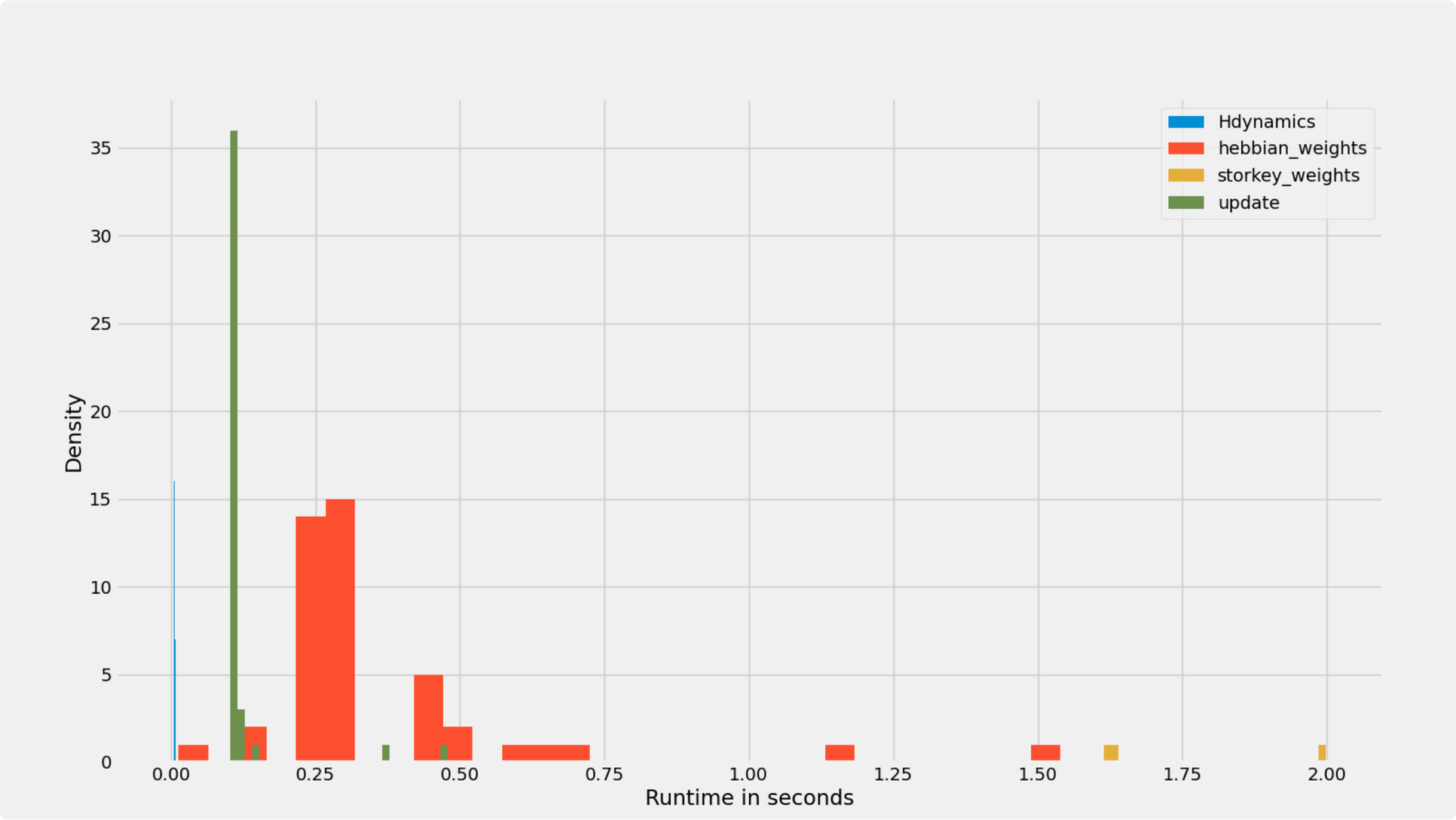
Methods:

- run times averaged over 10 runs
- each condition was ranked
- the team with the lowest overall rank won (for each project)

Histogram of runtimes for all teams (Hopfield)



Histogram of runtimes for all teams (Hopfield)



Who won?

Winners Hopfield network:

- Team 9: Rayan Raad, Samuel Perry, Michal Zakowiecki

It’s a tough challenge, they were the best allrounders! They were in the top 2 twice, 3rd once and once 5th. Really good, numpy-based solution for Storkey weight creation.

Benchmarking

Turing:

- diffusion and updating of dynamics

Methods:

- run times averaged over 10 runs
- each condition was ranked
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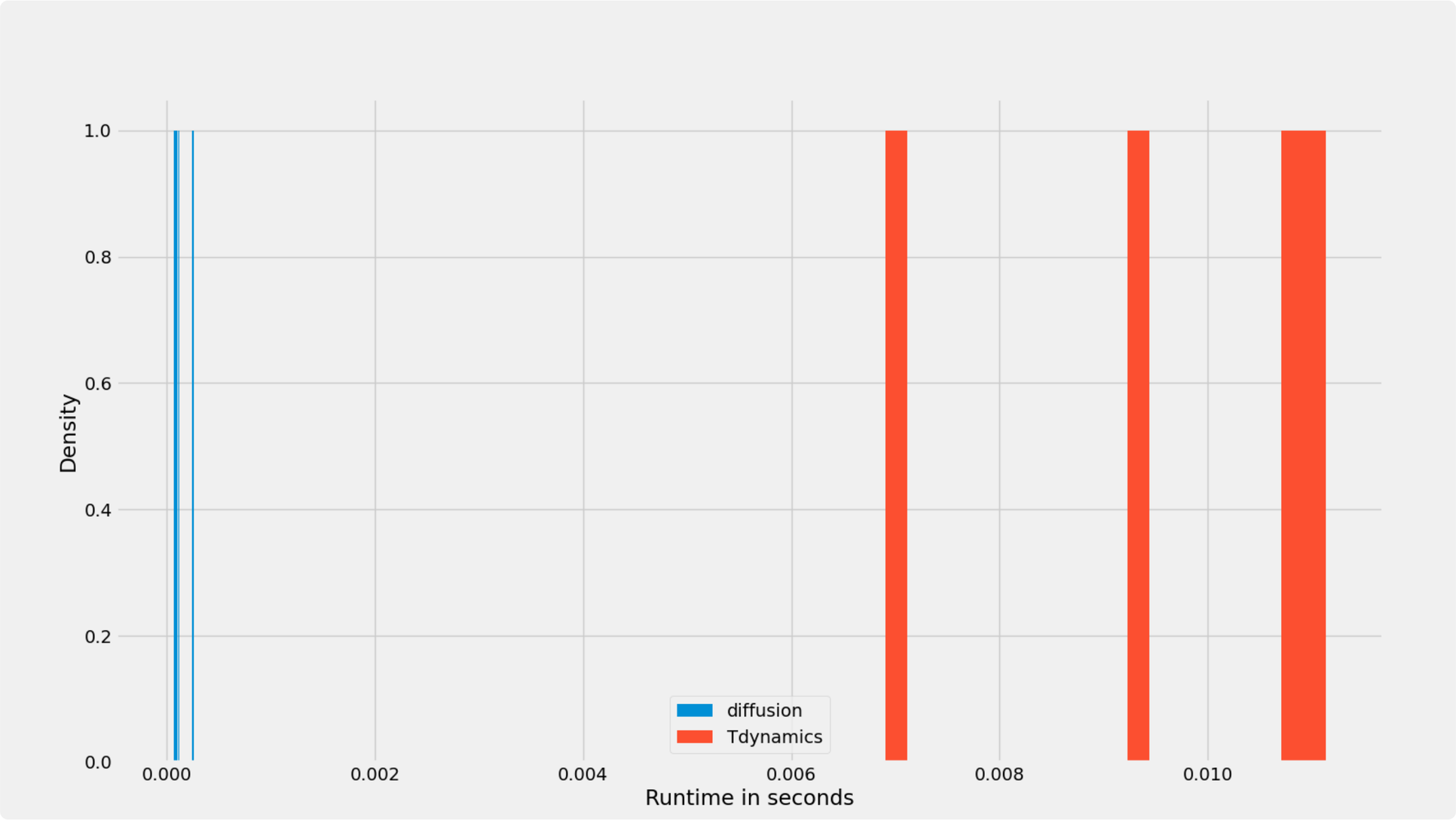
Histogram of runtimes for all teams (Turing)



Winners Turing

- Team 51: Henryk Graves, Isaia Mossi, Elyse Peguret 🎉🎉🎉🎉

Fastest diffusion and updating function with small variability (in runs).

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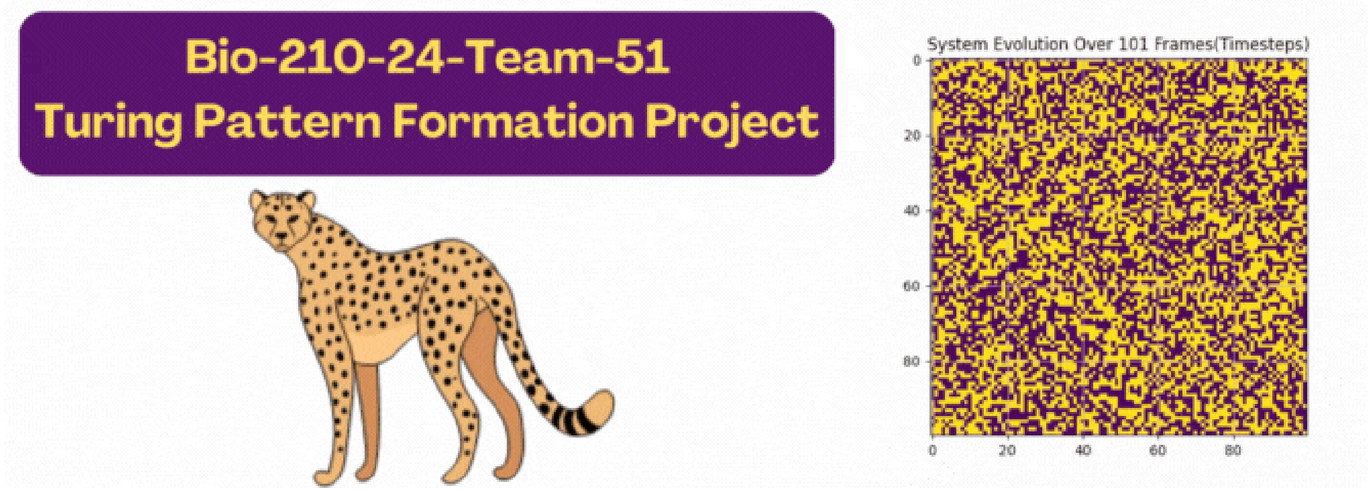
Fastest diffusion and updating function with small variability (in runs).

The gif below is from their readme:



Winners will get an email…

Congrats again to everybody and especially the winners!! Also, please reach out, if you need a letter of recommendation (when applying for your MA, etc.).

What’s next for improving your coding skills

- find a suitable Bachelor project. Many labs at SV use Python
- contribute to open source projects
- …
- join the Lemanic Life Sciences Hackathon 2025
- …

Lemanic Life Sciences Hackathon 2025

Last year three SV BA students were part of the winning team. They all took this class ;)

Check out the website for more info and sign up

Thanks to the team

Exercises:

- Teaching assistants: Mu Zhou, Albert Dominguez Mantes, Seda Radoykova, Shaokai Ye, Haozhe Qi, Oliver Ulrich, Andy Bonnetto
- Student assistants: Huyen Nguyen, Jennifer Shan (won last year’s hackathon!), Jeremy Barghorn, Leo Ganser, Leonardo Tredici, Louise Montlahuc, Lucie Manson, Maylis Muller, Pires Joana, Benjamin Gabriel Mancini, Eva Quinto, Ismael Salioski, Wesley Monteith, Viva Berlenghi, Henryk Viana, Timothe Dufour

Class feedback form

Please fill it out if you have not done so!

Link to questionaire

Upcoming schedule:

Today:

- Monday, Dec 16, 13 - 15: exercises working on your project

Release your final version on 23.12. at 10am!

Happy holidays