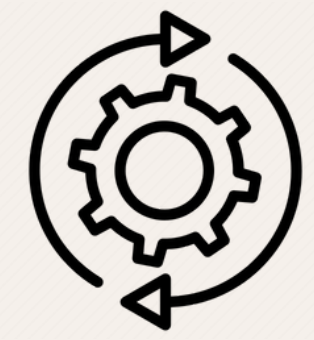


DISCOVERING THE METRICS FOR ASSESSING A PROJECT'S MATURITY: AN ANALYSIS OF KEY INDICATORS OF MATURITY

AUTHOR: Kendra Sartori
CONTACT: K.Sartori@student.tudelft.nl

RESPONSIBLE PROFESSOR: Sebastian Proksch
SUPERVISOR: Shujun Huang

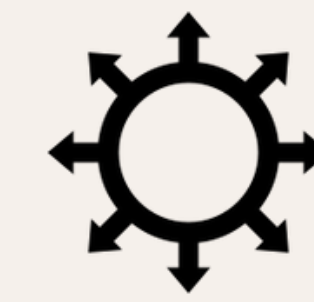
01 INTRODUCTION



Continuous Integration (CI) = a software engineering practice that promotes frequent code integration into a shared repository [1], known to improve productivity and quality of the software being developed [2]



Numerous uncertainties and drawbacks surrounding the **adoption and implementation** of CI [3], suggesting that these are influenced by the specific context in which they are employed [3]



Multifaceted approach studying which descriptive metrics have impact on the CI practices adopted, focusing on: project activity, maturity, topic, build life-cycle and CI pipeline implementation.



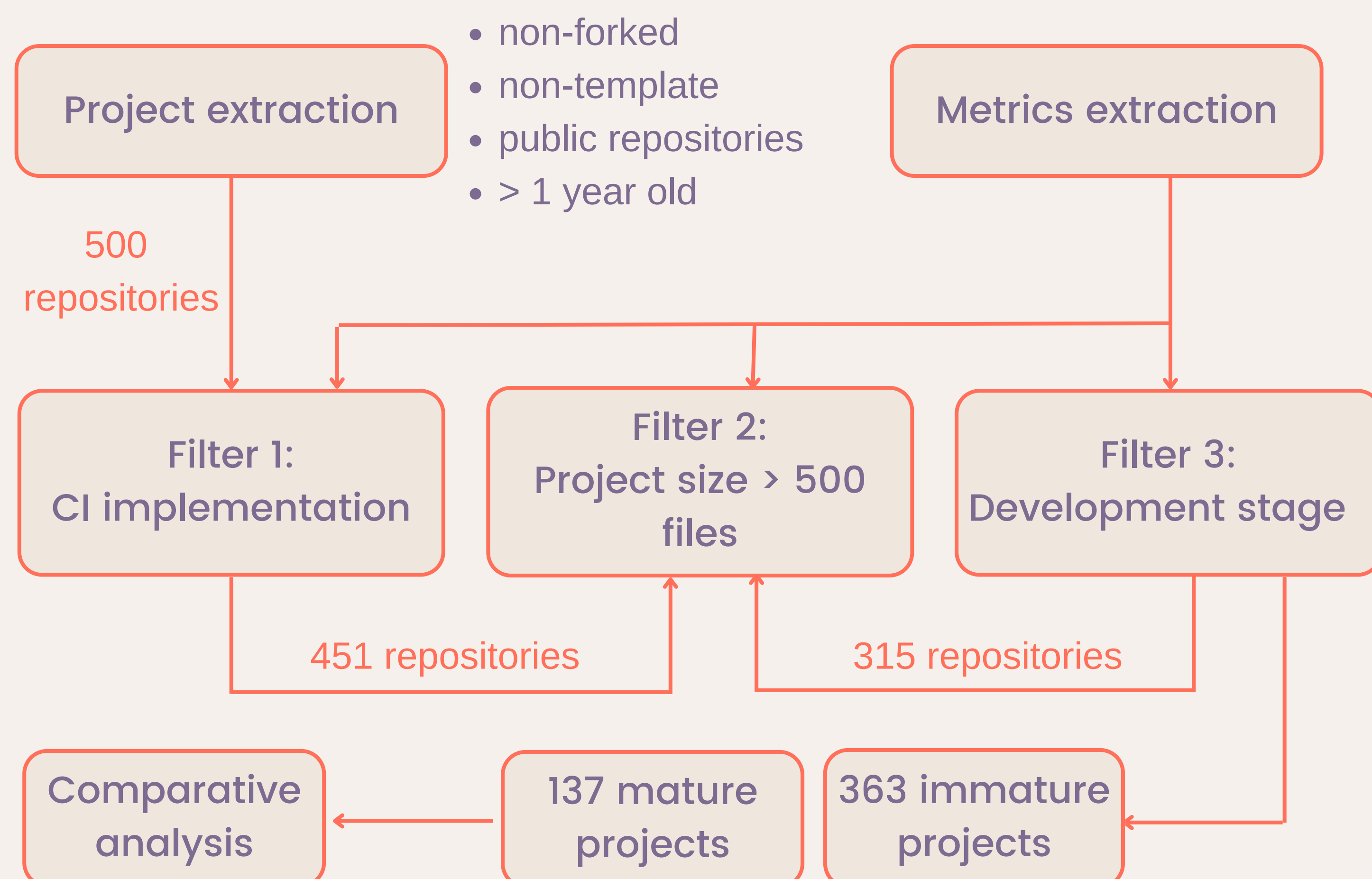
Primary focus on **project maturity**, important for assessing a project's release readiness, stability and progress, while also identifying areas for further improvement.

02 RESEARCH QUESTION

"What metrics can be used to describe the maturity level of a project?"

- To what degree does a project's activity reflect its level of maturity?
- To what extent is the popularity and community involvement of a project descriptive of its level of maturity?
- What additional metrics can be used to categorize a project as mature?

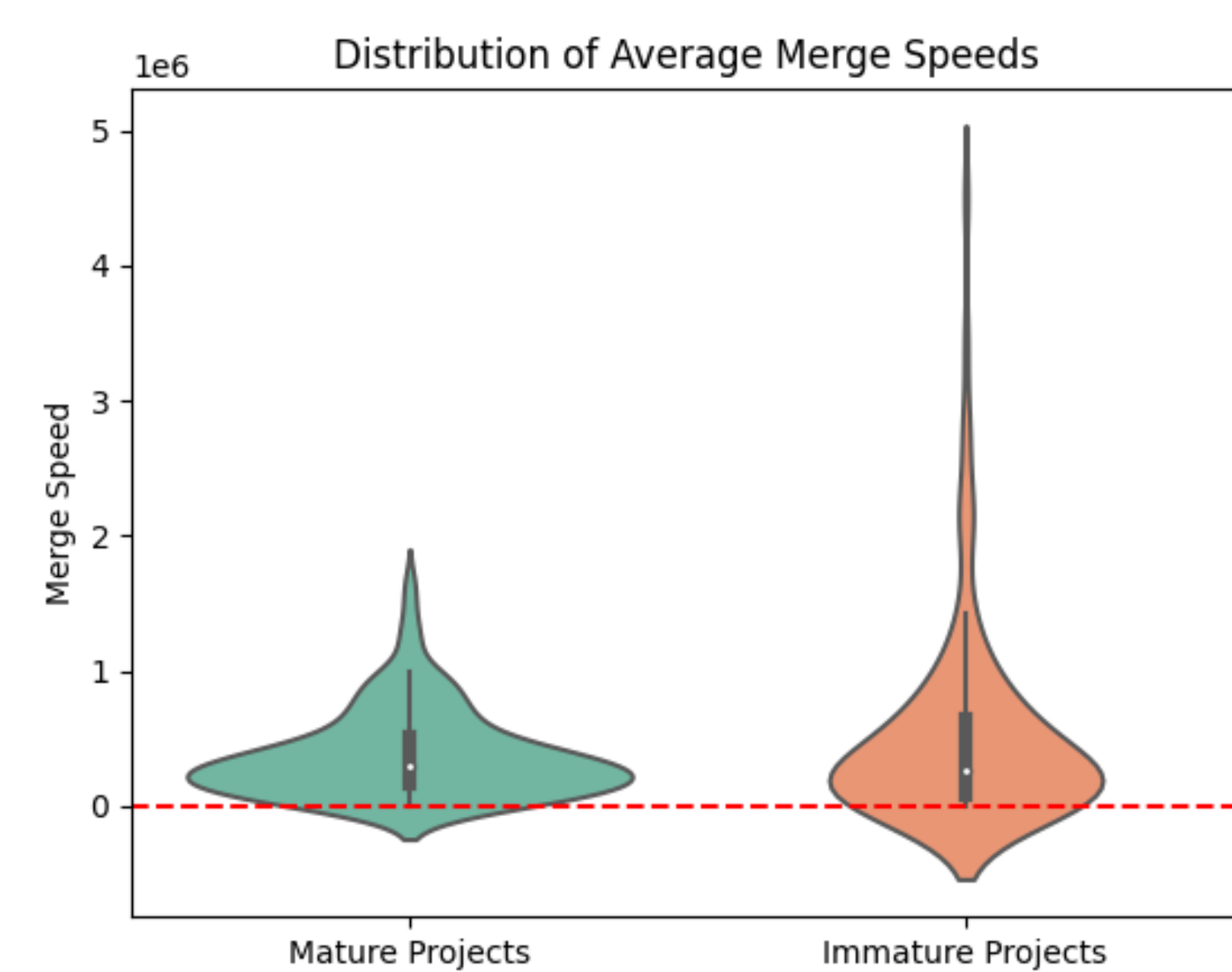
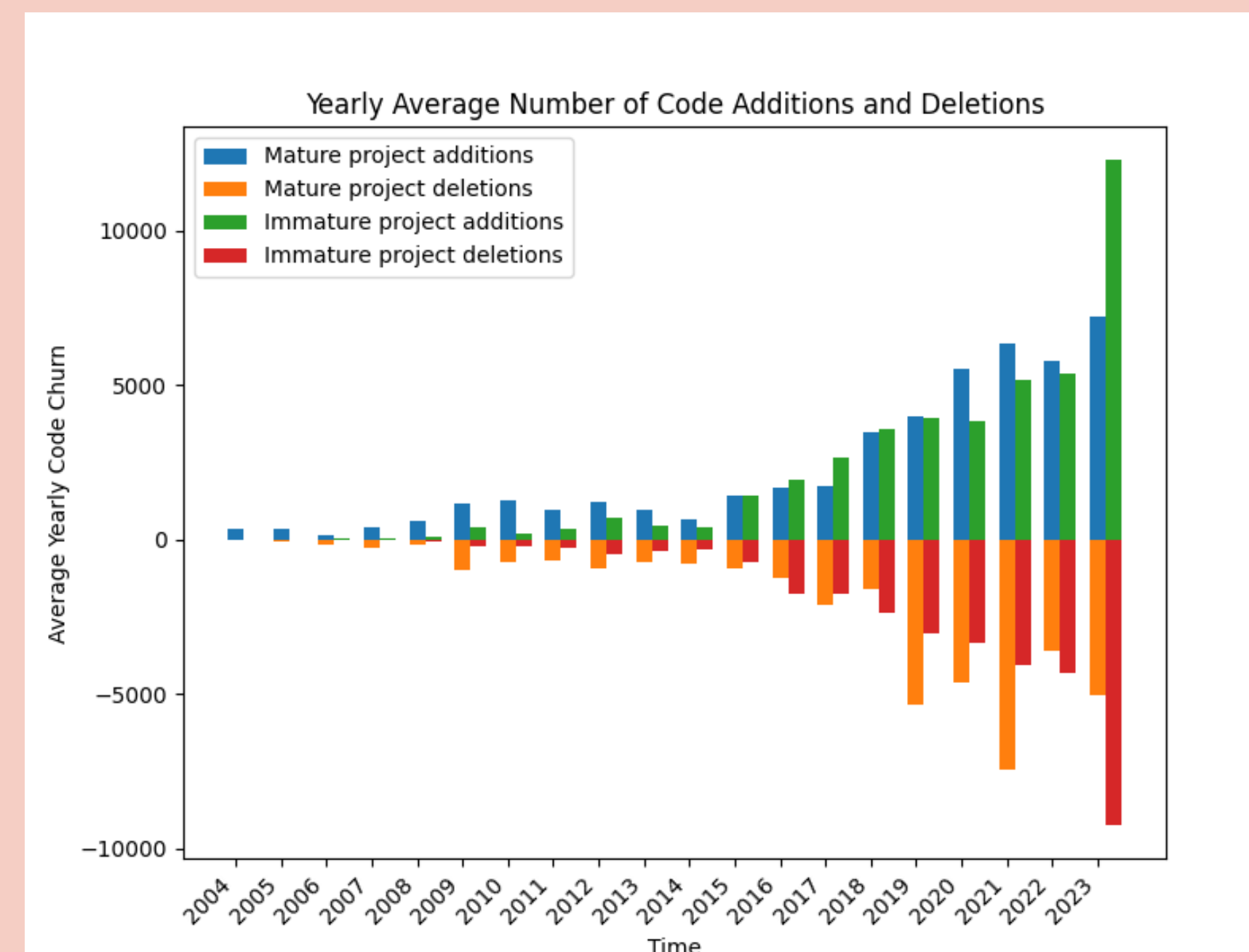
03 METHODOLOGY



04 RESULTS

PROJECT ACTIVITY

The code churn starts to be more constant when a project reaches a certain level of maturity.



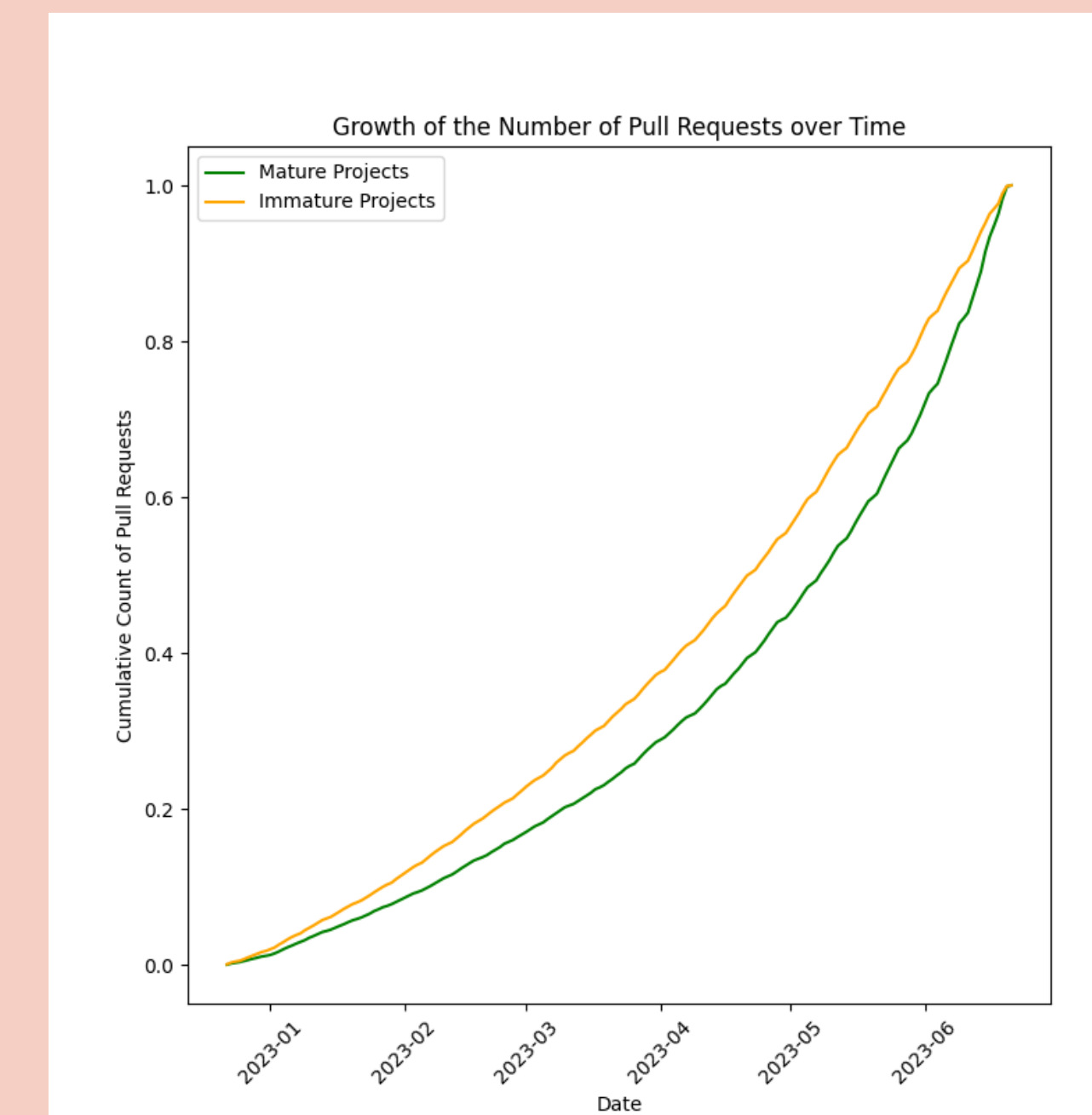
As projects mature, focus shifts towards bug fixes.

Merges occur at higher speed in mature projects

POPULARITY AND COMMUNITY ENGAGEMENT

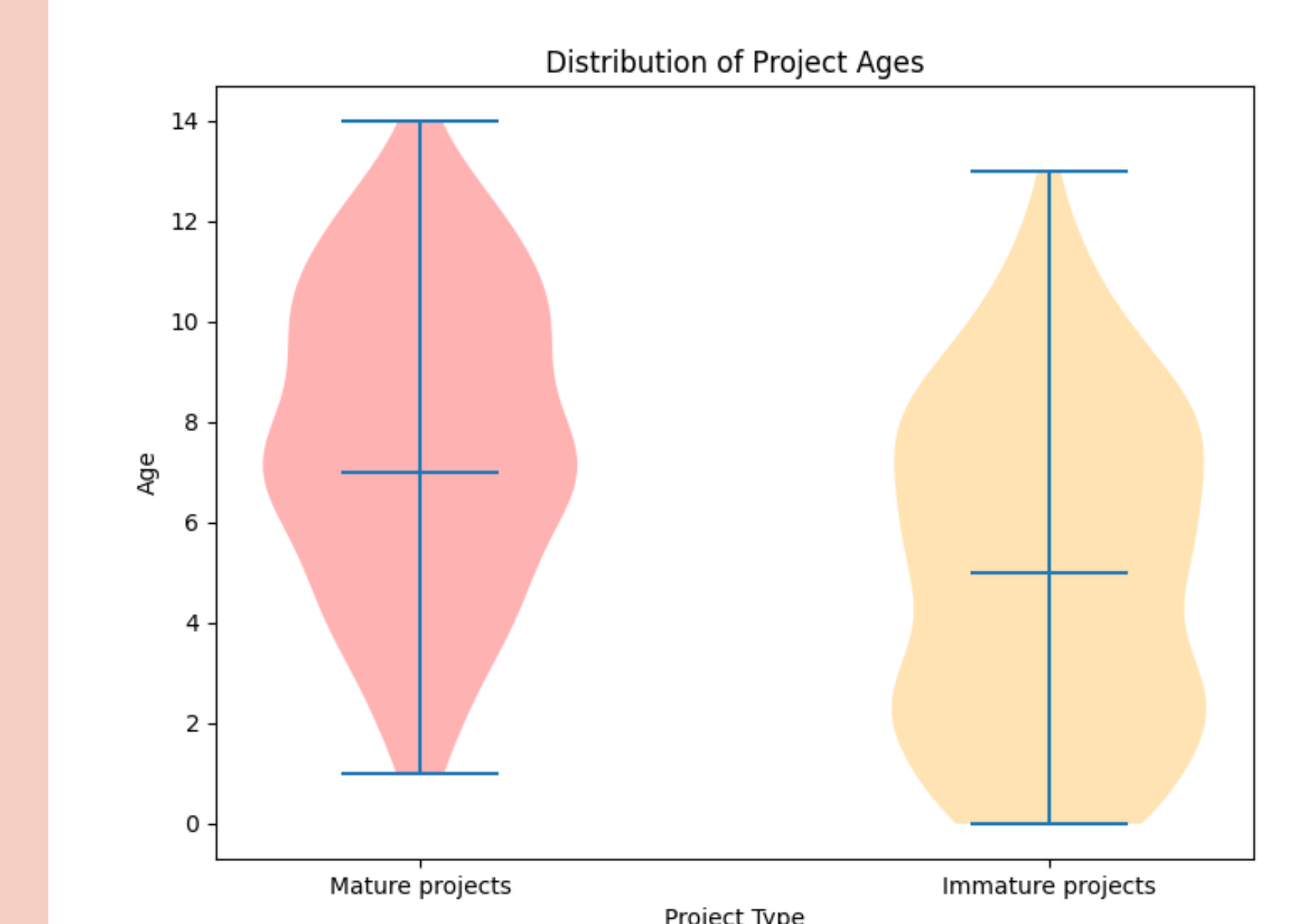
The number of stars, watchers and contributors tends to be higher in mature projects

Mature projects exhibit a steeper growth in the number of pull requests, possibly indicating higher popularity.



OTHER METRICS

Age alone is not a definitive indicator of maturity, but can be used in conjunction with other metrics to provide insights into the maturity level.



05 LIMITATIONS

- Small number of repositories studied
- Possible bias in data due to GitHub search API default sorting
- Study of commits is based on weekly aggregates
- Study of pull requests based on past 6 months of data

06 CONCLUSION

A combination of relevant metrics offers a more comprehensive perspective on a project's maturity level compared to relying on individual metrics alone.

The activity level, popularity, community engagement, age and size of a project are only some of the metrics which can set the foundations of a framework for classifying projects as mature.

REFERENCES: [1] Moritz Beller, Georgios Gousios, and Andy Zaidman. Oops, my tests broke the build: An analysis of travis ci builds with github. 04 2016.
 [2] Bogdan Vasilescu, Yue Yu, Huaimin Wang, Premkumar Devanbu, and Vladimir Filkov. Quality and productivity outcomes relating to continuous integration in github. pages 805–816, 08 2015.
 [3] Omar Elazhary, Colin Werner, Ze Li, Derek Lowlind, Neil Ernst, and Margaret-Anne Storey. Uncovering then benefits and challenges of continuous integration practices.03 2021.