

EnergyTrackr : A Modular Energy Regressions Detection Tool



<https://snail.info.unamur.be/>

François BECHET
Jérôme MAQUOI
Luis CRUZ
Benoît VANDEROSÉ
Xavier DEVROEY

NADI, University of Namur,
Belgium

Tools and Datasets track of ASE '26
Tue 13 - Thu 15 October 2026 Munich, Germany

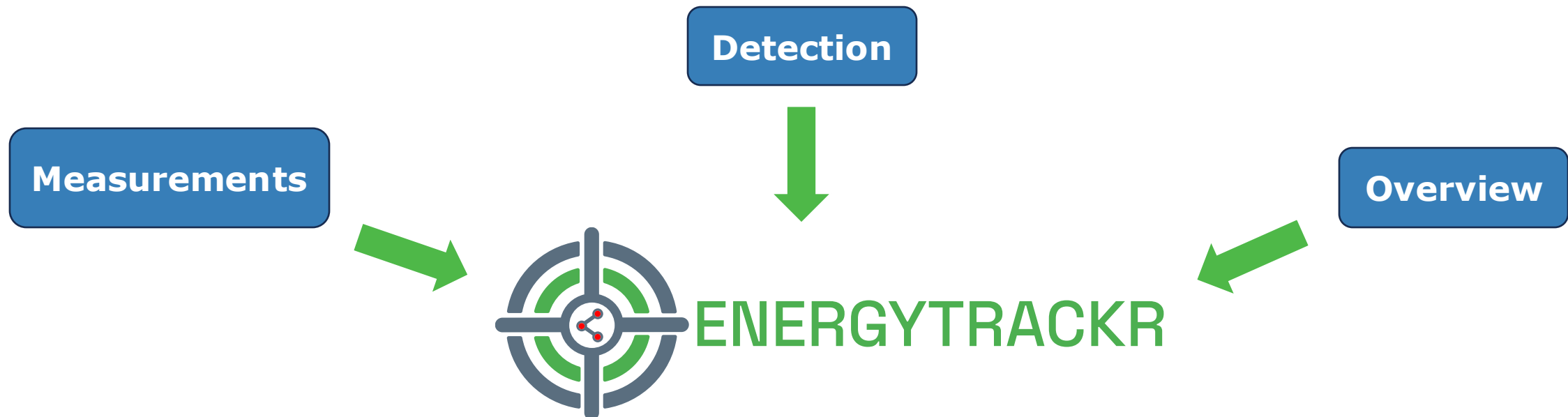
 jerome.maquoi@unamur.be

 <https://jeromemaquoi.github.io/>



Why software energy efficiency ?

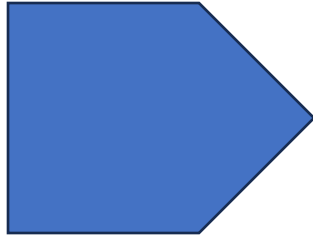
- Energy efficiency becomes an important dimension of software quality
- Tracking energy evolution = valuable to inform (developers) and understand (researchers)
- Complexity of energy efficiency regression identification



Workflow

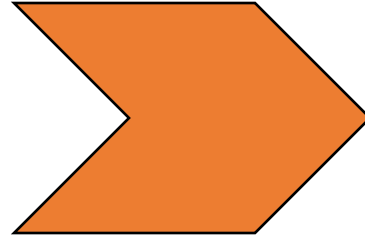


Measurements



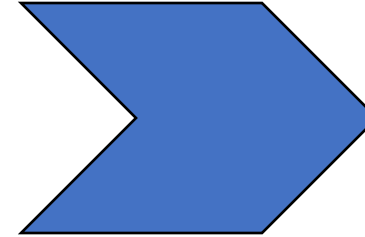
- Zen mode & freeze
- Warm up
- Repeat
- Keep it cool & rest
- Shuffle
- Automate

Preprocessing



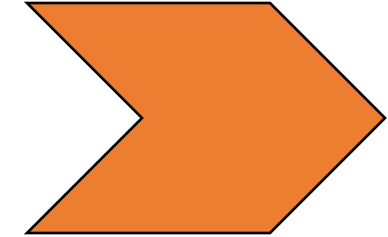
- Normal distribution detection
- Outliers filtering

Change detection



- 5 levels of significant changes
- Level 1 = Statistical significance

Visualization

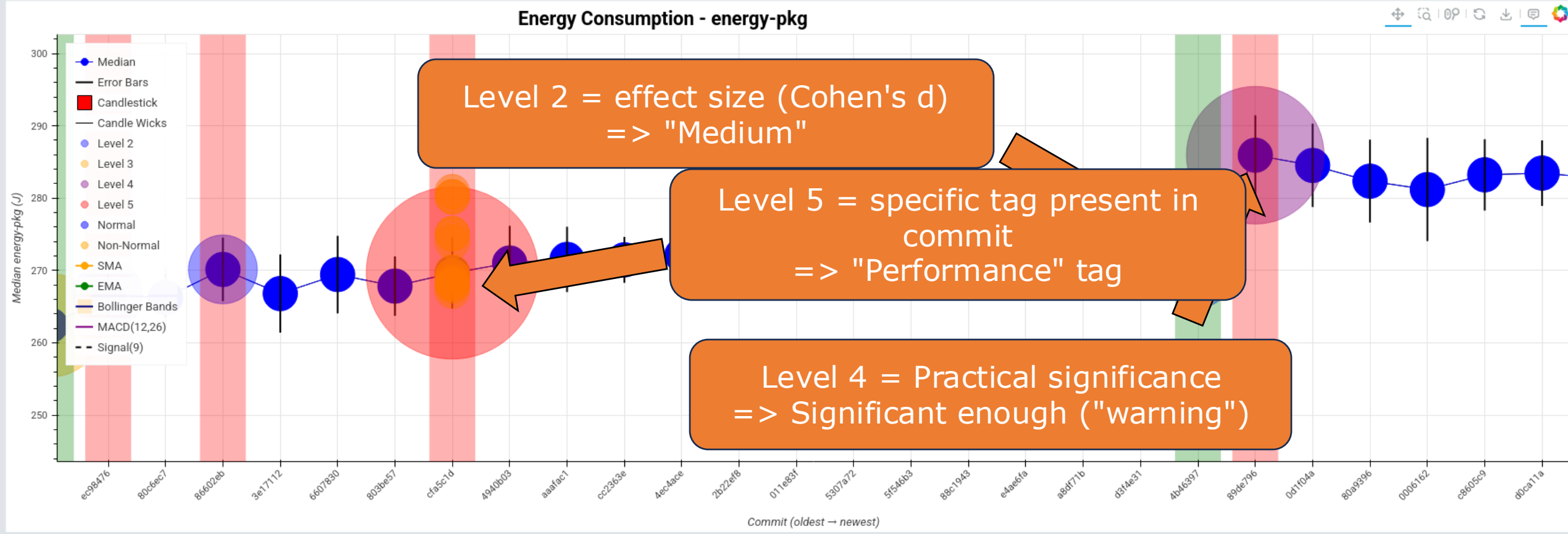


- Interactive plots
- List of commits

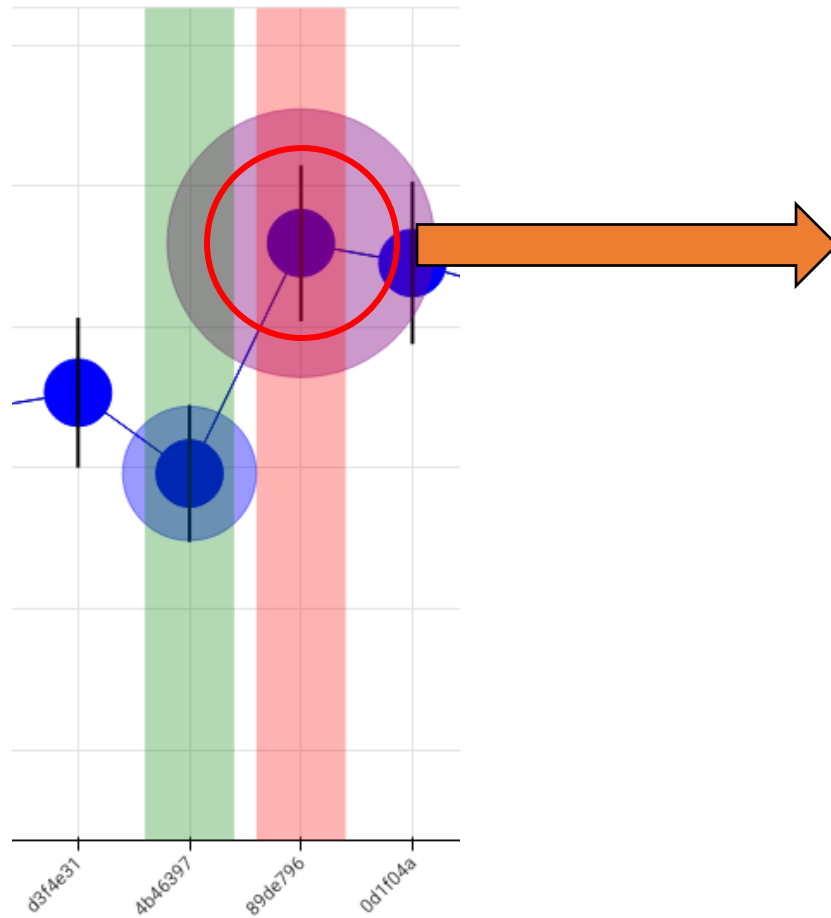
Visualization plots

Go to commit:

4b46397



Visualization plots



Commit 89de796

dependabot[bot] authored on Sep 28, 2021 Verified

Bump junit-jupiter from 5.8.0 to 5.8.1 (#1645)

Bumps [junit-jupiter](<https://github.com/junit-team/junit5>) from 5.8.0 to 5.8.1.

- [Release notes](<https://github.com/junit-team/junit5/releases>)

- [Commits]([junit-team/junit-framework@r5.8.0...r5.8.1](https://github.com/junit-team/junit-framework/commits/r5.8.0...r5.8.1))

updated-dependencies:

- dependency-name: org.junit.jupiter:junit-jupiter

dependency-type: direct:development

update-type: version-update:semver-patch

...

Signed-off-by: dependabot[bot] <support@github.com>

Co-authored-by: dependabot[bot] <49699333+dependabot[bot]@users.noreply.github.com>

master (#1645) · jsoup-1.23.2 ... jsoup-1.14.3

1 file changed

Q Filter files...

pom.xml

Search within code

▼ pom.xml

@@ -301,7 +301,7 @@

301 301 <dependency>

302 302 <groupId>org.junit.jupiter</groupId>

303 303 <artifactId>junit-jupiter</artifactId>

304 - <version>5.8.0</version>

304 + <version>5.8.1</version>

305 305 <scope>test</scope>

306 306 </dependency>

Preliminary evaluation



3 analyzed projects : Jsoup,
Univocity-parsers and
Fastexcel



- Stable and consistent energy values
- Identification of regressions

Systematic Detection of Energy Regressions in Software Version Histories

Jérôme Maquoi^{a,*}, François Bechet^a, Luís Cruz^b, Benoît Vanderose^a and Xavier Devroey^a

^aNADI, University of Namur, rue de Bruxelles 61, 5000, Namur, Belgium

^bDelft University of Technology, Postbus 5, 2600 AA, Delft, Netherlands

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ABSTRACT

Context: Green software engineering is emerging as a crucial response to the rising energy impact of information technology, especially in continuous development. However, challenges remain in devising automated methods to efficiently identify energy regressions across commits. In particular, little effort has been put into automatically detecting regressions at the commit level by identifying statistically significant changes in energy consumption.

Objectives: This paper presents ENERGYTRACKR, an approach for detecting energy regressions across multiple commits.

Methods: We empirically evaluated ENERGYTRACKR on 1,932 commits from five Java projects, assessing its ability to identify significant energy changes. We also compared a straightforward linear algorithm that analyzes the entire commit history with a more efficient dichotomous search algorithm.

Results: The evaluation demonstrates the effectiveness of ENERGYTRACKR in identifying significant energy changes across commits. Our findings highlight the efficiency of the dichotomous algorithm in uncovering overall software energy trends, achieving results comparable to the linear approach while reducing resource consumption and processing time.

Conclusion: We expect ENERGYTRACKR to help developers accurately monitor energy regressions and improvements in their projects and optimize their source code to reduce software energy consumption.



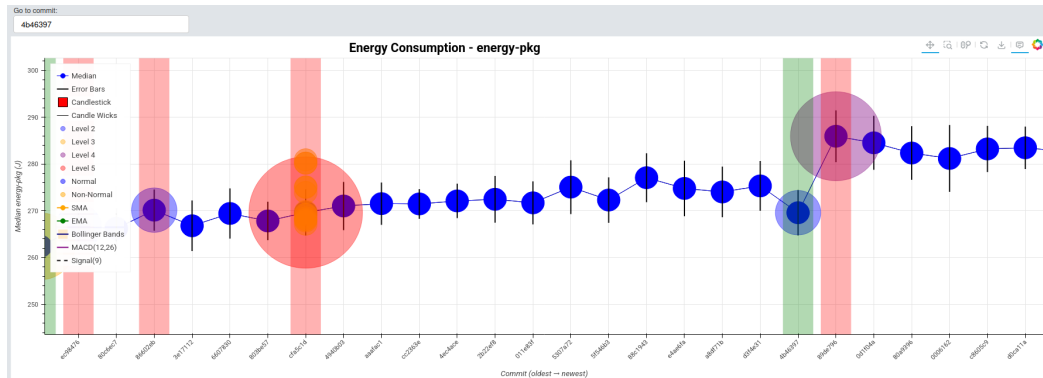
Wrap up



ENERGYTRACKR



Automatically detects, classifies and visualizes energy regressions (or improvements) across a commit history of Java projects



Screenecast



<https://tinyurl.com/2u63xfh8>

Code



<https://tinyurl.com/24z34vx9>

Pre-print



<https://tinyurl.com/5n8unv9h>