

The List is the Process: Reliable Pre-Integration Tracking of Commits on Mailing Lists

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Research on software evolution often focuses on mining changes in software repositories, but omits their pre-integration history.

Our work allows for tracking this invisible evolution of software changes on mailing lists (used by many low-level system components) by connecting all early revisions of changes to their final version in repositories. Since only updates to fragments (i.e., patches) are available, identifying semantically similar changes is a non-trivial task that we solve language-independently. We evaluate our method on high-profile OSS projects like the Linux kernel, and validate its high accuracy using an elaborately created ground truth.

Our approach can quantify properties of OSS development processes, which is an essential requirement for using OSS in reliable or safety-critical industrial products. We can also quantitatively determine if an open development process effectively aligns with given formal process requirements.

We will report on integration of our results in workflows of the Linux Foundation, one of the largest non-profit technology consortia for open source, and joint work with the automotive industry to deploy our results in practise.

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