Title: CodePanorama: A Language Agnostic Tool for Visual Code Inspection

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Approach and Motivation:

In the field of software development, CodePanorama is a novel tool that tackles the problem of code base quality assessment. Traditional methods mainly depend on various code metrics, which are helpful but sometimes detach from the actual tangible nature of the code. CodePanorama creates "code panoramas," or zoomed-out pictures of the whole code base, to present a visually intuitive methodology. With the help of this novel technique, which makes use of the human eye's natural ability for image processing, anomalies and valuable insights can be quickly identified without the need for in-depth numerical analysis. By utilizing the inherent human ability to recognize images, this visual method not only closes the gap between quantitative measurements and qualitative evaluation, but also increases the efficacy and efficiency of code reviews.

Aim and Novelty:

CodePanorama's main objective is to transform the field of code inspection by offering a visual tool that is independent of language and makes evaluating code quality easier. Its novelty is that it deviates from traditional metrics-based evaluations by providing a distinct visual representation that lets developers quickly assess the quality of the code. This method not only makes it easier to understand a project's structural and quality aspects more intuitively, but it also simplifies code review by making it understandable and accessible to all, regardless of the reviewer's level of programming language expertise. The visual analysis is further enhanced by the tool's ability to overlay additional project-relevant data, such as change frequency and author contributions, which offers a more comprehensive view of the code base than is possible with conventional inspection techniques.

Validation and Application:

CodePanorama's practical application in real-world scenarios, from professional software development projects to educational settings, serves as validation. The tool's original purpose was to help instructors evaluate student projects, but it has proven to have wider applications by helping developers make wise decisions regarding project development and maintenance. Code panoramas provide visual insights that are correlated with well-established software metrics, like complexity and technical debt, indicating that this tool can be used in conjunction with other software engineering tools. CodePanorama is a valuable tool that can be added to the collection of software quality assessment tools because of its ability to identify potential issues that are not captured by standard metrics.