Thesis Defense

Computer Science Master's Program

"A comparative study of the NPM, PyPI, Maven, and RubyGems open-source communities"

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Abstract:

Open-source software (OSS) ecosystems, defined as environments composed of package managers and programming languages (e.g., NPM for JavaScript) are essential for software development and foster collaboration and innovation. Although their significance is acknowledged, understanding what makes OSS communities healthy and sustainable requires further exploration. This thesis quantitatively assesses the health of OSS projects and communities within the NPM, PyPI, Maven, and RubyGems ecosystems. We explore five research questions addressing project standards, community responsiveness, contribution distribution, contributor retention, and newcomer integration strategies. Our analysis shows varied documentation practices, insider engagement levels, and contribution patterns. Our findings highlight both strengths and different areas for improvement across ecosystems. For example, RubyGems excels in the adoption of project documentation and exhibits the most even distribution of contributions among all contributors and highly active contributors. Meanwhile, NPM and Maven, characterized by a high ratio of individual contributions, need to better adopt a code of conduct, pull request templates, and increase the number of active contributors in a project. This thesis offers insights to developers and maintainers on how to strengthen ecosystems and support vibrant communities effectively.

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Time: 11:00 AM – 1:00 PM
Zoom: https://calpoly.zoom.us/j/89011033403
Committee: Dr. Kazerouni, Dr. Beard, and Dr. Gonzalez-Sanchez