

Graduate School of Science and Technology Master's Thesis Abstract

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Thesis title	A Large Scale Study on the Synchronicity of Libraries that cross Different Ecosystems.		
Abstract			
<p>With an increase in diverse technology stacks and third-party library usage, developers may inevitably need to switch programming languages when developing an application across technologies. To assist developers, maintainers now expand their support by releasing to multiple technologies and their ecosystems, i.e., a cross-ecosystem library. As Open Source Software (OSS), these libraries potentially require sustained contributions, especially when synchronizing across ecosystems. The goal of this thesis is to evaluate the extent to which a cross-ecosystem library synchronizes across ecosystems. I perform a large-scale empirical study of 1.1 million libraries from five different software ecosystems, i.e., PyPI for Python, CRAN for R, Maven for Java, RubyGems for Ruby, and NPM for JavaScript. This thesis finds that a significant majority (median of 37.5%) of contributors come from a single ecosystem, with a portion being independent (median of 24.06%). Three, i.e., PyPI, CRAN, RubyGems, out of the five ecosystems has the majority of source code is written using languages that are not specific to that ecosystem. Except for Maven, there is a significant difference in semantic versioning (median of 71.43% to 83.33%) across releases. In addition, the release cycle is library dependent, with a trend of 2 to 15 months between releases. Results find that a cross-ecosystem library may not be as synchronized as I assume, opening up new opportunities on how an ecosystem can integrate these libraries</p>			