Week 2: Empirical Analysis of F-Droid

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# Empirical Analysis of F-Droid

F-Droid is a self-described installable catalog of FOSS (Free and Open Source) apps for the Android platform (F-Droid, 2021). There are roughly four thousand applications within their collection. Each project’s entry contains downloadable links to source repositories and official milestone releases. Numerous researchers are leveraging this information to publish papers on trends across the mobile community.

While these efforts shine light into the problem space, they are not complete. However, F-Droid represents 0.1% of the size of Google Play Store’s three million apps (Statista, 2021). Comprehensively analyzing this fraction generates enormous data volumes, requiring significant processing power, which introduces an additional sampling layer. Further, Google Play Store is the defacto solution for mainstream professional development, and excluding this population entirely creates a selection bias. Mechanisms need to exist for identifying and bridging these empirical gaps.

# Literature Review

Krutz et al. (2015) collected and analyzed metadata about 4416 versions of 1179 F-Droid projects. They used a series of static analysis tools (see Table 1) to populate an SQLite database. Academic lesson plans continue to incorporate these results, but they are not actively maintained.

Table 1: Static Analysis Tooling

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| Tool | Description |
| Stowaway | Static analysis tool for finding under/over permissions |
| Androrisk | Androguard reverse engineering tool. Calculates risk indicators of an app |
| Sonar | Source code analyzer covering seven axes of code quality (architecture and design, comments, coding rules, potential bugs, complexity, unit tests, and duplications) |
| FindBugs | Static analysis tool for finding Java issues |
| Checkstyle | Java source analysis tool |
| PMD | Identifies maintainability risks within a codebase |
| Git | Software versioning solution with revision log |