



COMPATIBILITY ISSUES IN ANDROID: CHARACTERISATION AND DETECTION

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At a glance



Goal

Address compatibility issues in the Android ecosystem and provide insights to ensuring consistent app behaviour across different versions of the Android OS.



Strategies

- Develop a tool to identify and characterise silently-evolved methods (SEMs) across multiple releases.
- Conduct an in-depth analysis of the merging process between customised Android OS versions and official releases.
- Explore and validate the effectiveness of AndroMevol on real Android apps with compatibility issues.

Key outcomes



AndroSEA

We developed AndroSEA an automatic tool that identifies and characterises SEMs, often missed by APIs, across ten Android releases.



Insights into the causes of incompatibility

Customisation involving merging tasks can create overlapping modifications and ultimately compatibility issues. We uncovered insights into the frequency of merge tasks, textual conflicts and their impact on apps.



AndroMevol

We introduced AndroMevol to enhance tools and facilitate research by systematically collecting incompatible APIs from multiple OS brands.

Further information



Developers use APIs for Android apps to prevent compatibility problems which track changes but miss silently-evolved methods (SEMs) – the motivation behind AndroSEA.



Device vendors and OS providers leverage the open-source nature of Android OS to offer customised versions for different user needs. This process, which involves merging changes from new Android OS releases for bug fixes, security patches and features, can create inconsistencies and compatibility issues due to overlapping modifications.



Compatibility issues stem from system evolution and customisation by manufacturers and third-party OS providers. Despite efforts to address this through automated detection, there is still uncertainty around achieving the goal and the reliability of existing methods.



Issues detection involves gathering incompatible APIs and identifying related compatibility problems. We created AndroMevol by reproducing and comparing various detection approaches.

Access [AndroSEA](#) (and [its paper](#)) and [AndroMevol](#) (and [its paper](#)).
Learn more about the [analysis into customisation](#).

Learn more

To discover more about this project, contact [HumaniSE Lab](#) or scan the QR code.



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