Translating Code to Privacy Statements

Vijayanta Jain
University of Maine

When was the last time you read a privacy policy of any of your mobile applications?

Application’s Privacy Behvaior

≠

Privacy Policy

Problem Statement

71% of Android apps have 1.83 inconsistencies on an average (Zimmeck et al. 2016)

341 violations among 477 top applications (Slavin et al. 2016)

10.5% of 68,501 share information without informing users (Okoyomon et al. 2019)

At least **19% of 5,855** of children's apps are in violation with COPPA (Reyes et al. 2018)

Related Work

MAPS (Zimmeck et al. 2019)
– Identify inconsistency
– Helps regulators

– Does not resolve inconsistency
– Does not help developers

AutoPPG (Yu et al. 2015)
– Generate Privacy Policies
– Helps developers

– Uses a template
– Does not provide reason

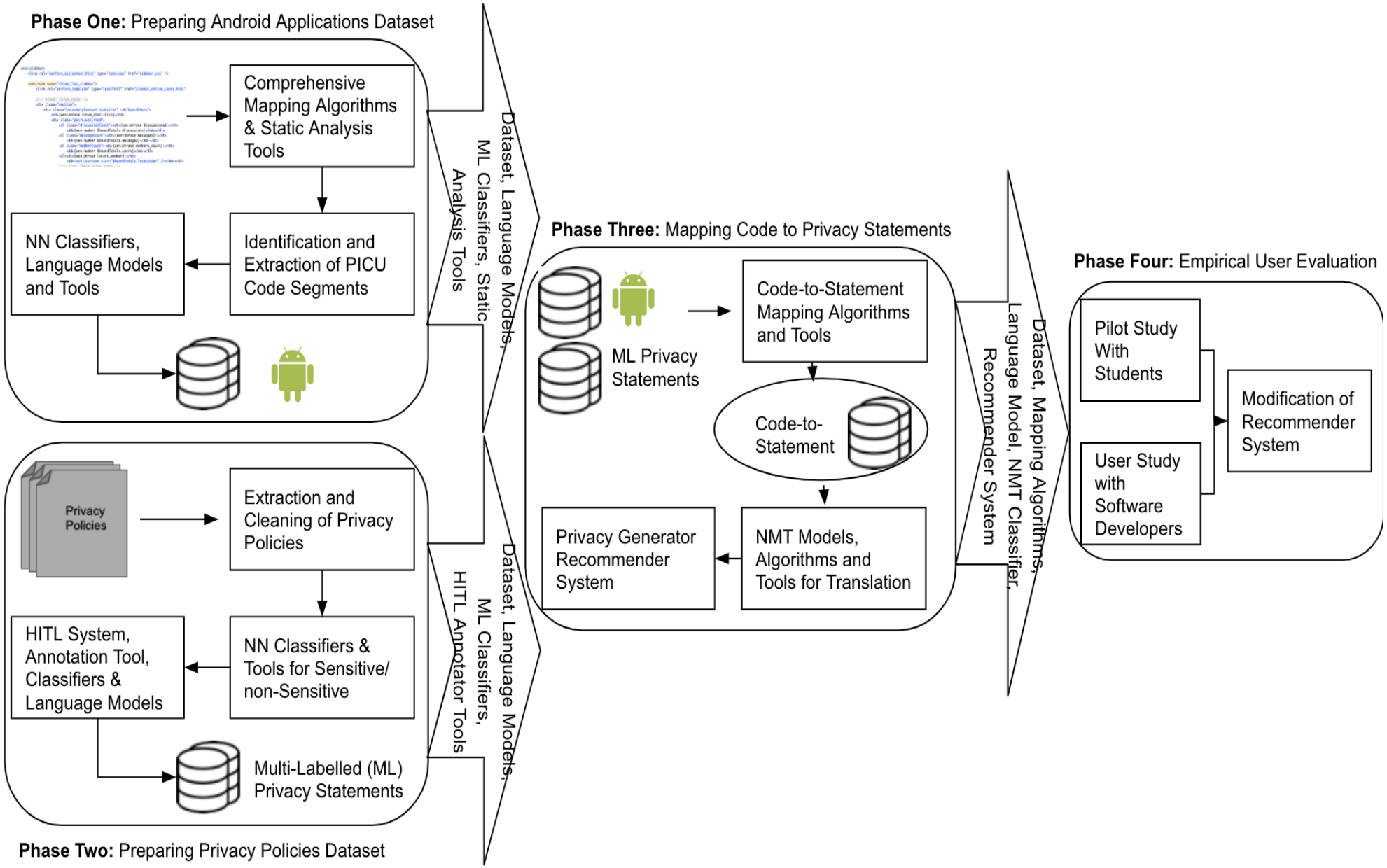
CLAP (Liu et al. 2018)
– Permission Usage Description
– Helps Developers

– Not proper notices
– Analyzes Application Description

Our Solution

An end-to-end framework that identifies code segments processing personal information and translate it to privacy statements

Methodology



Contributions

Novel approach to resolve inconsistency

End-to-end framework for developers

Translation dataset

Software tools

Language models

REFERENCES

[1]Liu, Xueqing, et al. "Mining android app descriptions for permission requirements recommendation." 2018 IEEE 26th International Requirements Engineering Conference (RE). IEEE, 2018.
[2]Okoyomon, Ehimare, et al. "On the ridiculousness of notice and consent: Contradictions in app privacy policies." (2019).
[3]Reyes, Irwin, et al. "“Won’t somebody think of the children?” examining COPPA compliance at scale." Proceedings on Privacy Enhancing Technologies 2018.3 (2018): 63-83.
[4]Slavin, Rocky, et al. "Toward a framework for detecting privacy policy violations in android application code." Proceedings of the 38th International Conference on Software Engineering. 2016.
[5]Yu, Le, et al. "Autoppg: Towards automatic generation of privacy policy for android applications." Proceedings of the 5th Annual ACM CCS Workshop on Security and Privacy in Smartphones and Mobile Devices. 2015.
[6]Zimmeck, Sebastian, et al. "Automated analysis of privacy requirements for mobile apps." 2016 AAAI Fall Symposium Series. 2016.
[7]Zimmeck, Sebastian, et al. "MAPS: Scaling privacy compliance analysis to a million apps." Proceedings on Privacy Enhancing Technologies 2019.3 (2019): 66-86.

Thank You!