

# Poster: Mobile Photo Data Management as a Platform Service

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## ABSTRACT

This poster presents Pixelsior, a new mobile platform service for photo data management in mobile apps.

## 1. INTRODUCTION

Many popular apps for mobile platforms interact with photo data. In those apps, interacting with photo data means not only to capture and to store them but also to classify, annotate, and enhance images either automatically or manually.

Implementing photo data interaction features is not a trivial task. However, such features are not well supported by mobile platforms. For example, Android provides only the basic functionality around managing photo data: i) encoding and decoding an image, ii) storing the encoded image in a file, and iii) indexing its metadata. Therefore, individual apps have to implement all the advanced features on their own or include libraries that provide such features, even though the same features may have been available in other apps in the device. Considering the rapid advances in image processing technologies, this siloed development effort is wasted and hampers the apps' adoption of new technologies. Even worse, individual implementations may result in fragmented data management problems as follows: i) An app may not be able to understand the relationship between two images, even though one is a mere resize of another. ii) Textual information extracted from an image by an app cannot be shared with other apps.

## 2. DESIGN

To overcome the challenges in mobile photo data, we design a platform, Pixelsior, that provides a new abstraction for photo data and a programming interface around the abstraction. The new abstraction encapsulate photo data within a logical object which has: a set of attributes and custom metadata tags and multiple images and relationship among them—for example, an image and a resize of the image. Also, the platform enables an image processing func-

tionality developed by a third party to be installed on the platform and be used by every app in the device. Figure 1 illustrates the architecture of Pixelsior.

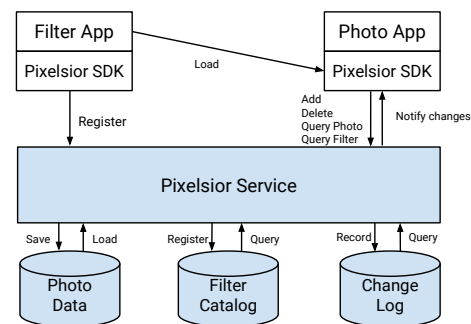


Figure 1: System Architecture of Pixelsior

## 3. RESULT AND DISCUSSION

Our initial prototype shows that our approach introduces low overhead (e.g., less than 10% in loading an image of  $816 \times 612$  pixels) while allowing a clean programming interface and a set of context-aware policies for efficient mobile apps.

This new abstraction not only gives a principled interface for apps, but also enables interesting tradeoffs in how to store and retrieve photo data. For example, a photo-editing app may choose to store filters applied on a photo, instead of resulting images to reduce its storage space usage.

Pixelsior is a new approach in managing photo data in mobile apps. Even though past work has explored i) how to upload photo data with more privacy [1] or ii) how to control sharing of photo data in a finer granularity [2], they did not explore a new abstraction and interface to manage photo data as Pixelsior does.

## 4. REFERENCES

- [1] M.-R. Ra, R. Govindan, and A. Ortega. P3: Toward privacy-preserving photo sharing. In *NSDI 13*.
- [2] Y. Xu, T. Hunt, Y. Kwon, M. Georgiev, V. Shmatikov, and E. Witchel. Earp: Principled storage, sharing, and protection for mobile apps. In *NSDI 16*.

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