

SWiPE X: Turn Your Swipes Into Meaningful Research

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Abstract—Short-form video platforms dominate online content consumption through powerful recommendation systems, yet most research relies on simulated or limited datasets that do not reflect real-world behavior. This demo introduces SWiPE X, a browser extension designed to anonymously collect and analyze user interactions with short-form videos (e.g., YouTube Shorts). The system captures fine-grained behavioral signals alongside Quality of Experience (QoE) metrics to enable the study of video traffic efficiency, recommendation performance, and user engagement. Attendees will be able to interact directly with the system and explore real-time analytics, illustrating how everyday viewing behavior can be transformed into large-scale, privacy-preserving research insights.

I. INTRODUCTION

Short-form video content has experienced rapid growth, attracting billions of users worldwide. Platforms such as YouTube Shorts play a central role in shaping user engagement through algorithmic recommendations [1] [2], [3].

Despite their importance, understanding how users interact with such systems remains limited. Existing approaches often rely on simulated environments or partial observations, which do not accurately reflect real-world behavior.

To address this gap, we introduce SWiPE X, a browser-based tool designed to collect anonymized interaction data and enable large-scale analysis of user behavior in short-form video environments.

II. SYSTEM OVERVIEW

SWiPE X is a browser extension designed to collect and analyze anonymized user interactions during short-form video consumption. The system enables large-scale, real-world data collection while ensuring privacy and transparency.

A. Data Collection

The extension passively captures fine-grained interaction events, including:

- Playback actions: play, pause, resume
- Navigation actions: swipe, skip
- Engagement actions: like, dislike, share
- Viewing behavior: watch duration and rewatch events

In addition, the system collects contextual information such as video metadata (e.g., video ID, category, duration, resolution) and Quality of Experience (QoE) metrics, including startup delay and playback interruptions.

B. Data Representation

As illustrated in Fig. 1, captured events are structured using a lightweight JSON format, enabling efficient storage and analysis. Each event is associated with an anonymous session identifier and includes interaction type and metadata.

```
{  
  "user_id": "abc-123",  
  "session_id": "xyz-456",  
  "event": "video-swipe",  
  "video_id": "abc456",  
  "watch_time": 3.2,  
}
```

C. Privacy and Ethics

SWiPE X is designed with privacy by default. No personally identifiable information (PII) is collected, and users are identified only through random session IDs. Data is collected with user consent and complies with GDPR. The system presents a low privacy risk: only anonymized interaction data is collected, with minimal permissions and no access to personal data. While usage patterns could theoretically be inferred, no direct identification is performed.

III. DEMO DESCRIPTION

A. Demo Scenario

The demo showcases an end-to-end pipeline that transforms real user interactions with short-form videos into actionable research insights. Attendees will experience how everyday viewing behavior can be captured, anonymized, and analyzed in real time using SWiPE X.

B. Demo Flow

The demonstration provides an interactive overview of SWiPE X. Participants briefly interact with short-form videos (YouTube Shorts) while the system captures anonymized interaction events in real time. The extension uses content scripts to detect interface changes and logs events based on DOM (Document Object Model) mutations and timing intervals. These events are processed locally to compute per-video engagement metrics, which are then aggregated and visualized through a dashboard.

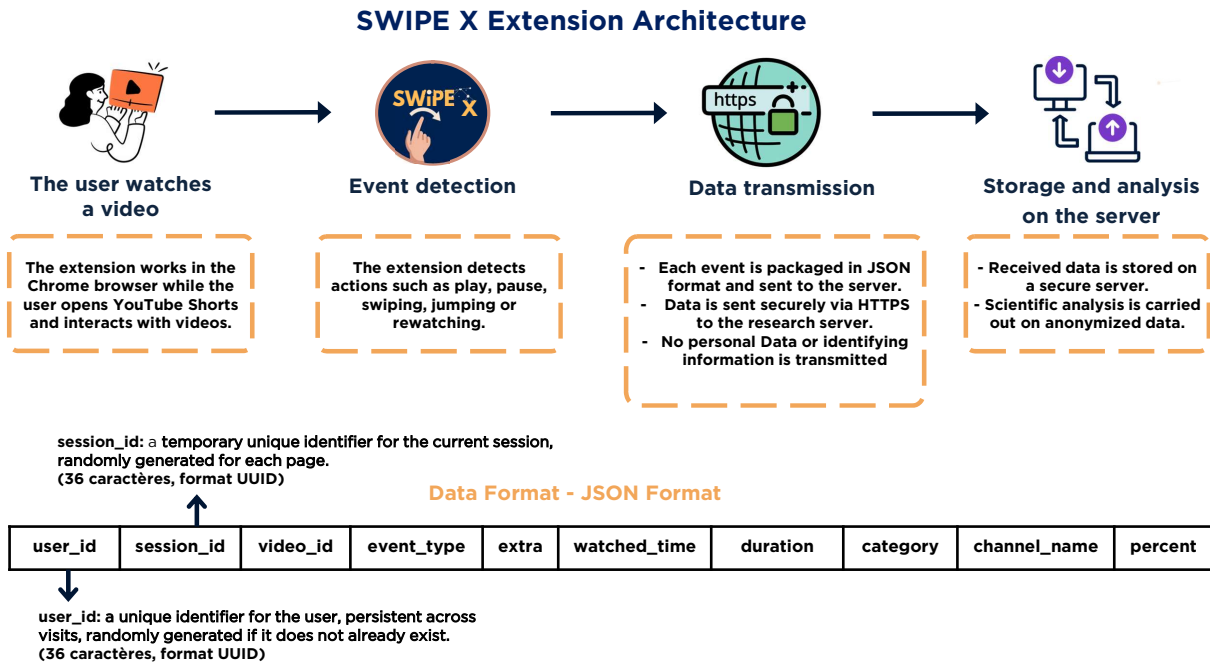


Figure 1: SWiPE X architecture

C. User Experience

The demo provides an interactive and transparent experience, allowing participants to:

- Understand how their interactions are transformed into research data
- Visualize their consumption and engagement patterns
- Observe the impact of recommendation systems on viewing behavior
- Gain insights into the efficiency of short video delivery

IV. USER INTERFACE

A. Consent Form

Before any data collection, users are presented with a consent interface detailing the purpose of the study, the type of data collected, and data usage policies. Participation is voluntary, and data collection begins only after explicit user approval.

B. Survey

Following consent, users are invited to complete a short optional survey capturing general viewing habits and preferences. Responses are anonymized and linked only to a randomly generated session identifier.

To complement interaction data, the survey provides contextual information about user behavior, as summarized in Table I.

C. Dashboard

SWiPE X provides users with a real-time dashboard that summarizes their interaction behavior. The interface displays key metrics such as total videos watched, cumulative watch

time, average watch percentage, and detailed engagement history.

This visualization enhances transparency and allows users to better understand their own consumption patterns.

V. RESEARCH OBJECTIVES AND DEPLOYMENT

SWiPE X enables the large-scale analysis of short-form video consumption by leveraging real-world, anonymized user interactions. The system supports three main research objectives: (i) evaluating video traffic efficiency by measuring the proportion of viewed versus skipped content, (ii) analyzing the impact of recommendation systems on user engagement and exposure, and (iii) studying fine-grained user behavior to better understand attention dynamics.

The tool is publicly accessible through a dedicated website: <https://jamilal01.github.io/SWiPE-X-Website>, where users can install the extension and contribute to the study. SWiPE X is currently supported on desktop chrome browser and on Android devices via the Kiwi Browser ¹, enabling broader and more diverse data collection.

VI. SYSTEM REQUIREMENTS

The demo requires a standard device with a modern web browser and an active internet connection. Attendees can install and interact with the SWiPE X extension during the demonstration. The current implementation targets YouTube Shorts; however, the approach can be adapted to other short-form platforms (e.g., TikTok or Instagram Reels) with additional integration.

¹<https://kiwi-browser.en.uptodown.com/android>

| Question | Options |
|--|--|
| How often do you watch YouTube Shorts? | Daily; Several times per week; Rarely; Never; Prefer not to say |
| What device do you usually use? | Desktop computer; Laptop; Smartphone; Tablet; Prefer not to say |
| What type of content do you prefer? | Comedy & Entertainment; Fashion & Lifestyle; Movies & Animation; Science & Technology; Gaming; Sports; Prefer not to say |
| Your age group? | 18–25; 26–35; 36+; Prefer not to say |
| Do you often interact with Shorts? | Like or Dislike; Comment; Share; All of the above; Passive viewing; Prefer not to say |

Table I: User Survey

Information and Consent to Participate
Select language / Choisir la langue
English

PROJECT IDENTIFICATION

- ★ **Project initiative**
This experiment is initiated by the **Inria Centre at Université Côte d'Azur (Sophia Antipolis)**.
- ★ **Project lead**
GIROIRE Frédéric – CNRS Research Director.
- ★ **Other researchers involved**
 - **MOULIERAC Joanna** – Associate Professor, Université Côte d'Azur (COATI project-team).
 - **TURLETTI Thierry** – Inria Research Director (DIANA project-team).
 - **BARAKAT Chadi** – Inria Research Director (DIANA project-team).
 - **ABOU LTAIF Jamil** – PhD student, Inria Centre at Université Côte d'Azur (COATI project-team).
- ★ **Project teams and location of the experiment**
This project is conducted by the joint **COATI and DIANA project-teams**, affiliated with the **Inria Centre at Université Côte d'Azur**, located at: 2004 route des Lucioles, 06902 Sophia Antipolis, France.
- ★ **Project title**
SWIPE X
- ★ **Ethical approval**
This project has received a **favorable opinion from Inria's Operational Committee for the Evaluation of Legal and Ethical Risks (COERLE)**.
- ★ **Voluntary participation**
Your participation in this project is **entirely voluntary**. After reading and understanding the "Data Collection Notice" below, your acceptance of this form indicates your free and informed consent to participate, without any constraint or external pressure.
If you require additional information to make your decision, please contact the person listed below.

DATA COLLECTION NOTICE

- ★ **Purpose of data collection**
The purpose of this data collection is to analyze how users interact with short-form videos in order to improve the design and performance of short-video platforms.
- ★ **Data collected**
If you agree to participate, the browser extension will collect:
 - User interactions with Shorts videos (play, pause, resume, skip, swipe, like/dislike, share, stop, rewatch)
 - Video characteristics (identifier, channel, category, duration, resolution, watch time)
 - Quality of service indicators (startup time, playback interruptions)
- ★ **Participation requirements**
Participation is limited to individuals aged **18 years or older**. If you are under 18, you must immediately uninstall the extension.
- ★ **Use of data**
The collected data will be used exclusively in an **anonymous and aggregated form** for scientific research purposes, including academic publications and presentations.
- ★ **Data storage and protection**
Data are collected anonymously and stored on an encrypted, password-protected storage device for a period of **15 years**, in accordance with research regulations.
- ★ **Participants' rights**
This study complies with the General Data Protection Regulation (GDPR). Due to the anonymous nature of the data, the rights of access, rectification, and deletion cannot be exercised after data collection.
- ★ **Contact**
For any questions regarding the project or data collection, you may contact:
ABOU LTAIF Jamil – jamil.abou-ltaif@inria.fr

Do you agree to participate in this study?

Figure 2: Consent interface presented to users prior to participation.

VII. CONCLUSION

SWiPE X turns real user interactions into useful insights while protecting privacy. It combines data collection, clear user interfaces, and real-time analytics to support scalable studies of video streaming, recommendation systems, and user engagement. This demo also complements our recent work on the hidden cost of short-form video browsing [4].

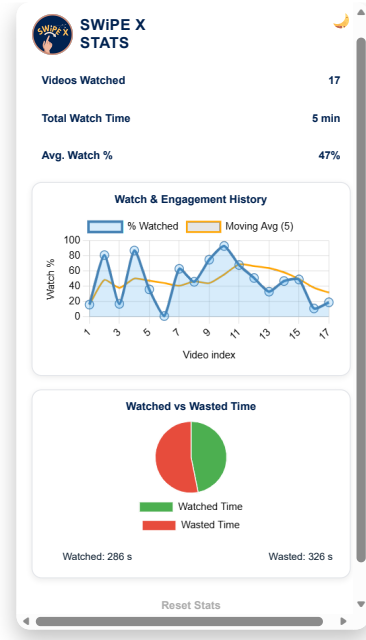


Figure 3: User dashboard displaying interaction statistics and engagement patterns.

ACKNOWLEDGMENT

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