Standard Practices for Data Processing and Multimodal Feature Extraction in Recommendation with DataRec and Ducho (D&D4Rec)

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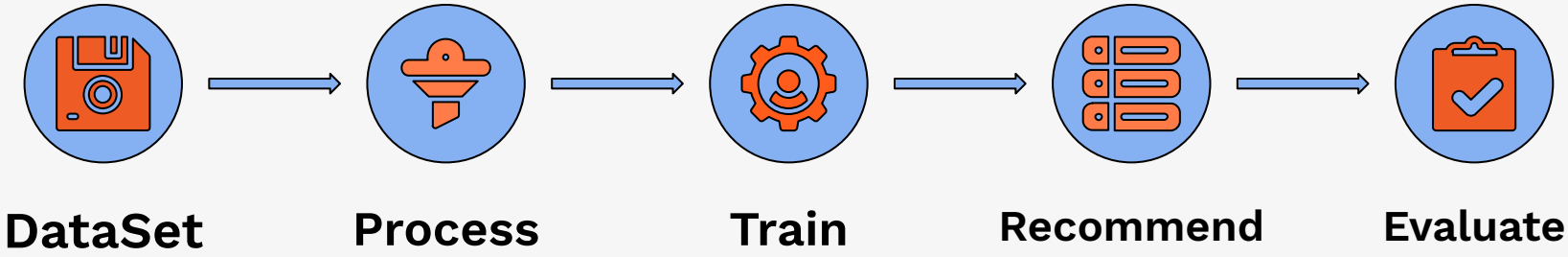
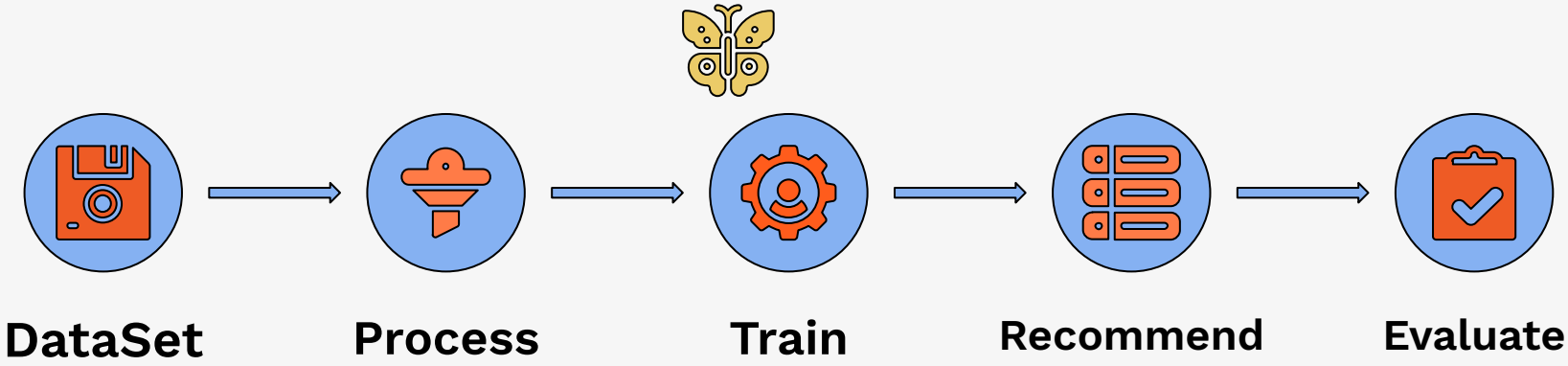
Offline Evaluation Pipeline



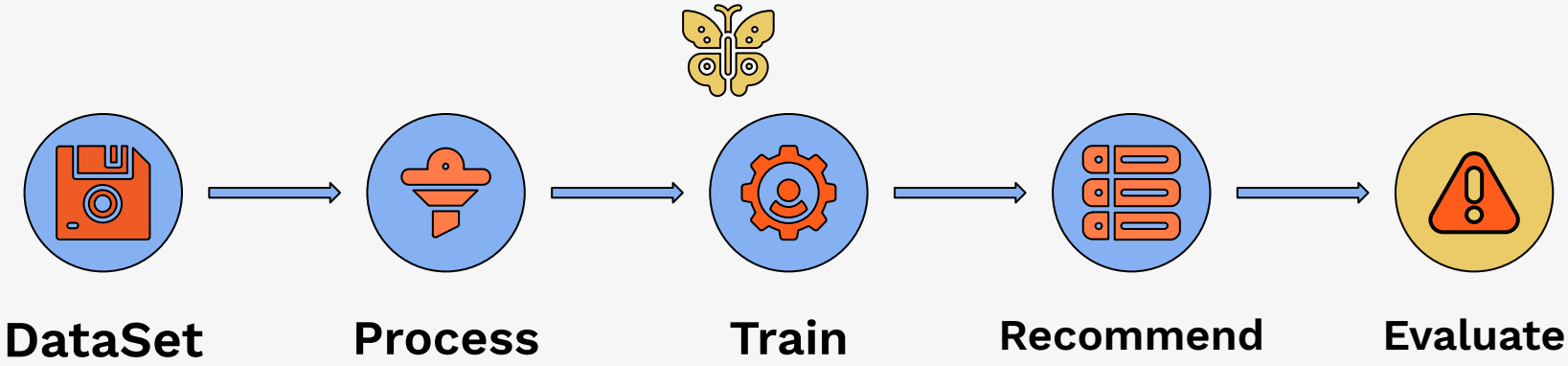
Typical pipeline for offline evaluation in recommender systems.

Offline Evaluation Pipeline



Without **standardization**, small changes may cause butterfly effect.

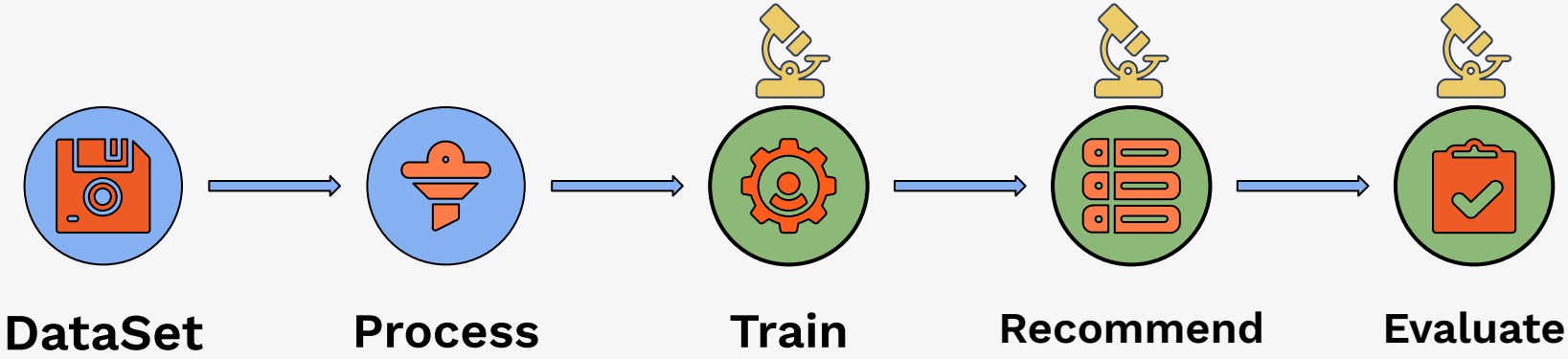
Offline Evaluation Pipeline



Small **variations** at any stage can affect the results, compromising **reproducibility** and **fair comparison**. [1,2]

[1] Armstrong et al., CIKM 2009: “Improvements that don't add up: ad-hoc retrieval results since 1998
[2] Ferrari Dacrema et al., RecSys 2019: “Are we really making much progress? A worrying analysis of recent neural recommendation ...”

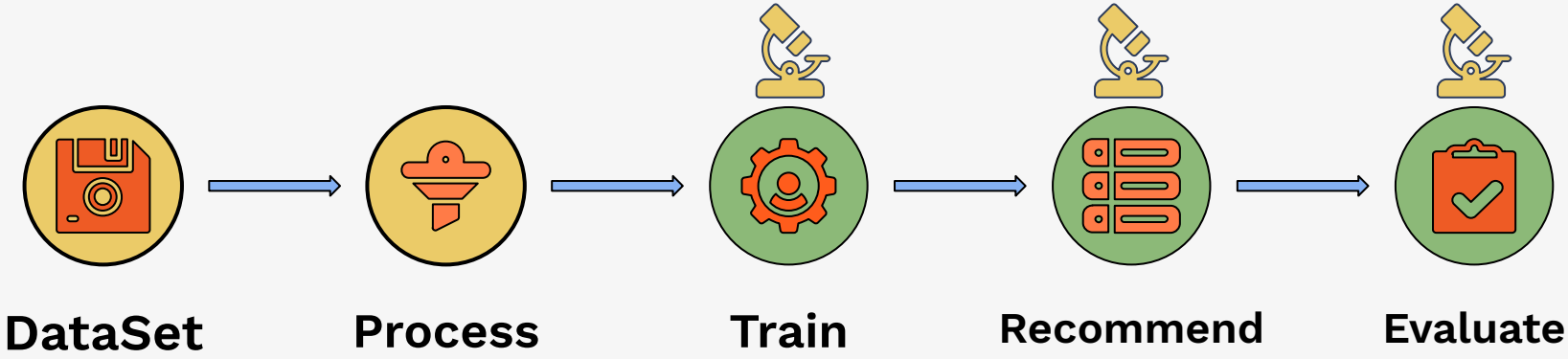
Offline Evaluation Pipeline



So far, notable efforts has been devoted to guarantee models **reproducibility** [3] and fair **evaluation practices** [4].

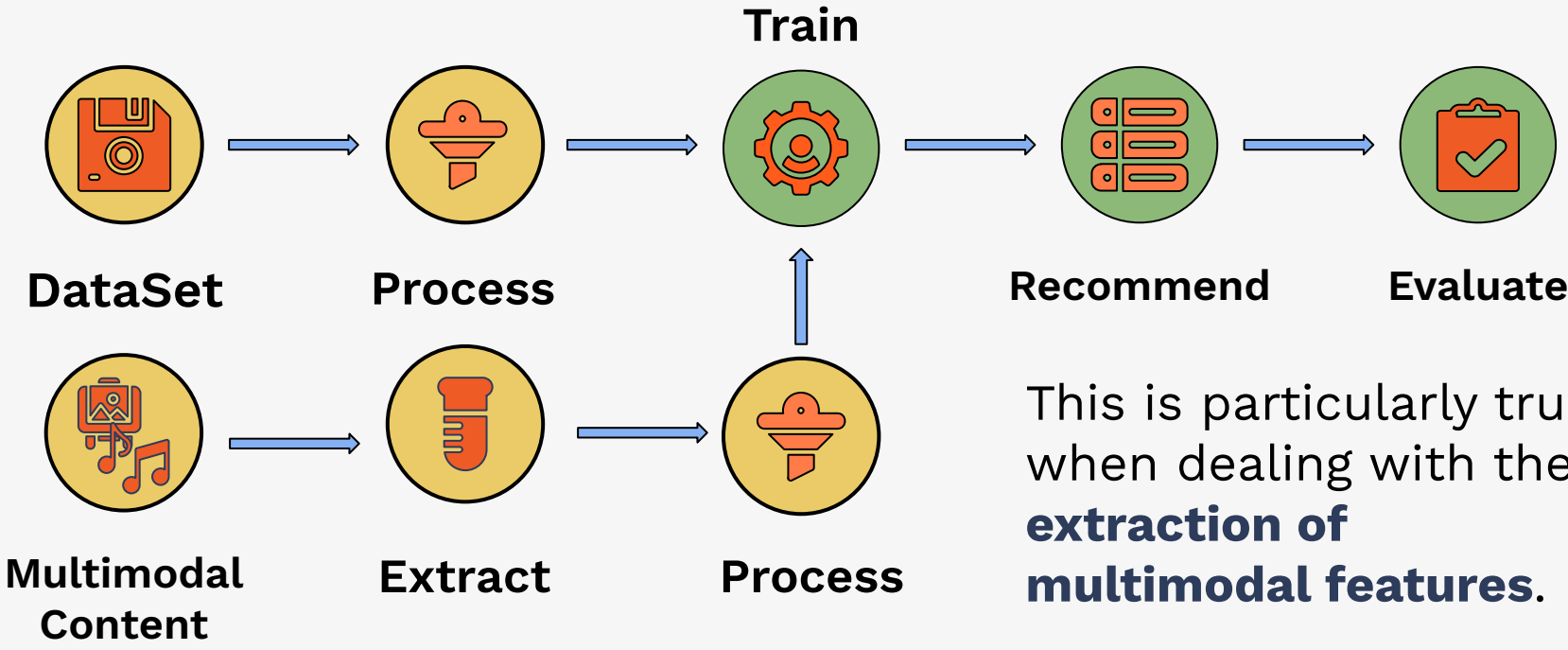
[3] Bellogín & Said, UMUAI 2021: "Improving accountability in recommender systems research through reproducibility"
[4] Sun, RecSys 2023: "On Challenges of Evaluating Recommender Systems in an Offline Setting"

Offline Evaluation Pipeline



Less attention has been devoted to the first stages of the pipeline, in particular the **data selection** and the **data processing**.

Offline Evaluation Pipeline



This is particularly true when dealing with the **extraction of multimodal features**.

D&D4Rec aims to fill this gap

D&D4Rec

With this tutorial we provide an overview of the ***most common practices*** *for data selection, filtering, processing and splitting in recommendation.*

Moreover, we present ***multimodal feature extraction*** *procedures for recommendation.*

D&D4Rec

*Not only theory but also practice with **two hands-on***

DataRec Hands-on

Exploring how to use and integrate the DataRec **Python library** for data selection and processing [5].

Ducho Hands-on

Presenting a **unified framework** designed to streamline multimodal feature extraction for recommenders [6].

[5] Mancino et al., SIGIR 2025: "DataRec: A Python Library for Standardized and Reproducible Data Management in Recommender ..."
[6] Attimonelli et al., WWW 2024: "Ducho 2.0: Towards a More Up-to-Date Unified Framework for the Extraction of Multimodal ..."

&D4Rec

DataRec: A Python Library for Standardized and Reproducible Data Management in Recommender Systems

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hands-on

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Python library for data selection and processing [5].

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DataRec: A Python Library for Standardized and Reproducible Data Management in Recommender Systems

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Ducho 2.0: Towards a More Up-to-Date Unified Framework for the Extraction of Multimodal Features in Recommendation

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[5] Mancino et a
[6] Attimonelli et al.,

D&D4Rec

Standard Practices for Data Processing and Multimodal Feature Extraction in Recommender Systems Offline Evaluation

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Tutorial Overview

01 *Introduction*

02 *Data Handling and Processing*

03 *Data Characteristics*

04 *Introduction to DataRec*

05 ***Hands-on Session:*** *DataRec*

06 *Multimodal Feature Extraction*

Tutorial Overview

05 ***Hands-on Session:*** *DataRec*

06 *Multimodal Feature Extraction*

07 *Introduction to Ducho*

08 ***Hands-on Session:*** *Ducho*

09 *Final Remarks*

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