Interactive Evaluation of Recommender Systems with SNIPER - An Episode Mining Approach

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Motivation

Recommender systems are typically evaluated through **offline** methods, **online** methods or **user studies**. By **aggregating** all the data into a **single measurement**, the **fine-grained nature** of user-item interactions is entirely **lost**. Examining **interesting patterns** emerging from user-item interactions on a much lower level is beneficial, but **non-trivial**…

Episode Mining

Assume a dataset of events. An "event" consists of a label and a timestamp. An "episode" is a Directed Acyclic Graph (DAG) with **events** as **nodes**, and **edges** indicating a **precedence relation** between nodes.

Given two episodes G and H, an "episode rule" $G \Rightarrow H$ implies that if event G occurs, event H occurs within a given reference time-window. The **confidence** of a rule represents the fraction of occurs of G that can be extended to H. Events in a recommendation setting can be **pageviews**, **impressions** and **clicks**.

We **extended SNIPER** with support for **sequence data** and **episode mining**, with an application in qualitatively **evaluating** logs of a **recommender system**.

SNappy Interactive Pattern ExploreR (SNIPER)

… is a web-based **tool** for interactive **pattern exploration**. It offers a wide range of **algorithms** to produce patterns, along with a variety of **interestingness measures** and **visualisations** to **qualitatively evaluate** and **interpret** the **generated patterns**.

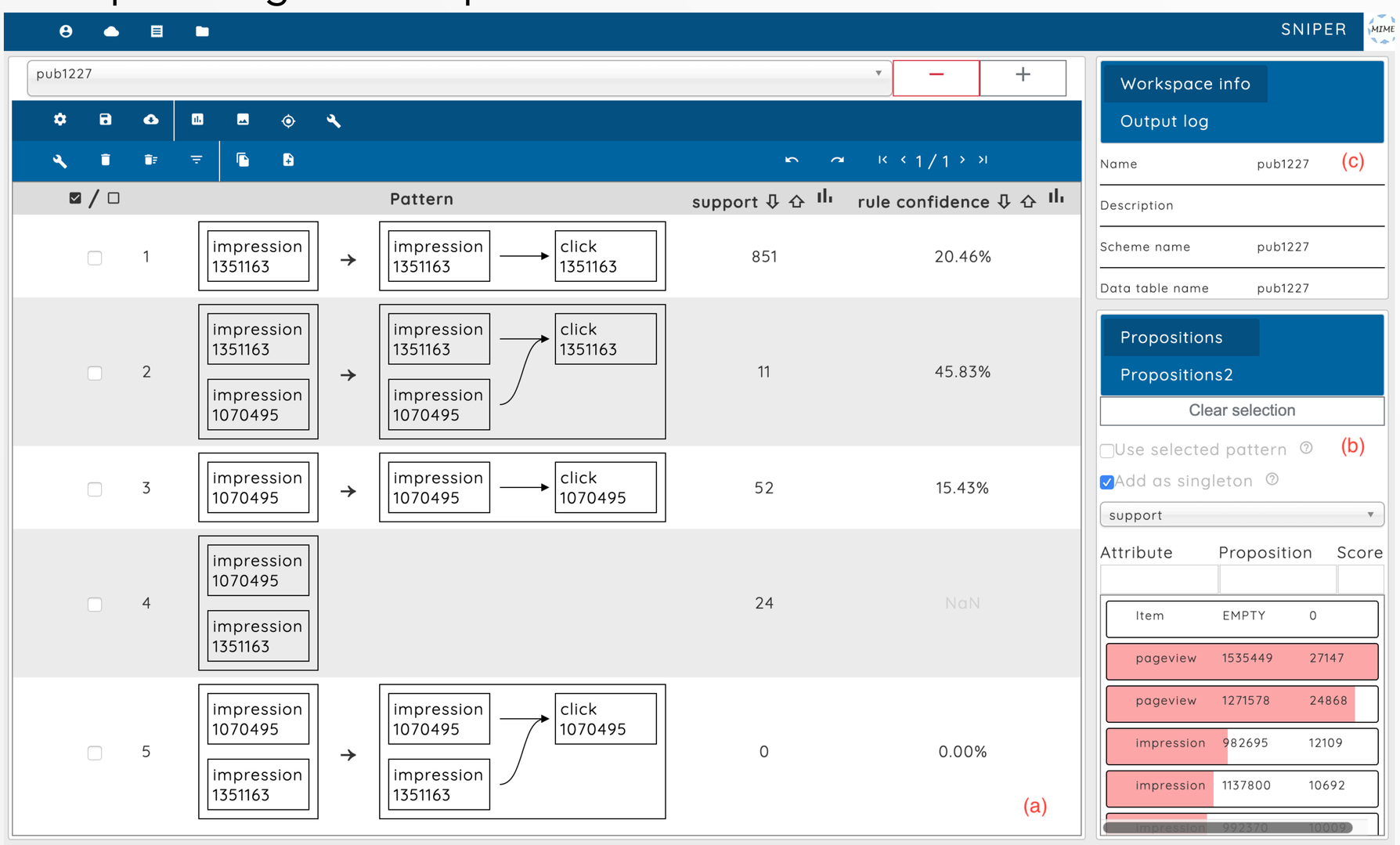

Fig. 1: The SNIPER front-end, where users can interactively construct new patterns using basic building blocks and/or adapt existing patterns:

a) work dock with patterns that can be adapted feely

b) source dock with basic building elements for patterns

c) additional information dock

Examples:

- Pattern 1 shows an episode rule occurring frequently (*support of 851*), and showing a CTR (*rule confidence*) of 20,46% for item 1351163.
- Pattern 2 shows an increase in CTR for 1351163 when also 1070495 has been recommended.

User ID	Time	Pageview	Impression	Click
0	1	1		
0	2		2	
0	2		3	
0	3			3
1	7		2	
…	…	…	…	…

Table 1: The expected data format for SNIPER.

Source:

Video:

Paper:

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