#  Exploratory Visual Sequence Mining Based on Pattern-Growth

**Abstract:**

 Sequential pattern mining finds applications in numerous diverging fields. Due to the problem’s combinatorial nature, two main challenges arise. First, existing algorithms output large numbers of patterns many of which are uninteresting from a user’s perspective. Second, as datasets grow, mining large numbers of patterns gets computationally expensive. There is, thus, a need for mining approaches that make it possible to focus the pattern search towards directions of interest. This work tackles this problem by combining interactive visualization with sequential pattern mining in order to create a “transparent box” execution model. We propose a novel approach to interactive visual sequence mining that allows the user to guide the execution of a pattern-growth algorithm at suitable points through a powerful visual interface. Our approach (1) introduces the possibility of using local constraints during the mining process, (2) allows stepwise visualization of patterns being mined, and (3) enables the user to steer the mining algorithm towards directions of interest. The use of local constraints significantly improves users’ capability to progressively refine the search space without the need to restart computations. We exemplify our approach using two event sequence datasets; one composed of web page visits and another composed of individuals’ activity sequences.