

On User Behaviour Adaptation Under Interface Change

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Abstract

Different interfaces allow a user to achieve the same end goal through different action sequences, e.g., command lines vs. drop down menus. Interface efficiency can be described in terms of a cost incurred, e.g., time taken, by the user in typical tasks. Realistic users arrive at evaluations of efficiency, hence making choices about which interface to use, over time, based on trial and error experience. Their choices are also determined by prior experience, which determines how much learning time is required. These factors have substantial effect on the adoption of new interfaces. In this paper, we aim at understanding how users adapt under interface change, how much time it takes them to learn to interact optimally with an interface, and how this learning could be expedited through intermediate interfaces. We present results from a series of experiments that make four main points: (a) different interfaces for accomplishing the same task can elicit significant variability in performance, (b) switching interfaces can result in adverse sharp shifts in performance, (c) subject to some variability, there are individual thresholds on tolerance to this kind of performance degradation with an interface, causing users to potentially abandon what may be a pretty good interface, and (d) our main result – shaping user learning through the presentation of intermediate interfaces can mitigate the adverse shifts in performance while still enabling the eventual improved performance with the complex interface upon the user becoming suitably accustomed. In our experiments, human users use keyboard based interfaces to navigate a simulated ball through a maze. Our results are a first step towards interface adaptation algorithms that architect choice to accommodate personality traits of realistic users.