EvolveUI: User Interfaces that Learn and Evolve With User Proficiency

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Over 700 Million adults in the world lack basic literacy and skills to be able to effectively use a simple application on their smartphone. Even if these applications are designed using illustrative icons to overcome the literacy barrier, the complexity of their user interface is often overwhelming for low-literacy users. In this project, we developed EvolveUI, a design approach that diverges from conventional interface design by evolving in complexity alongside a user's growing proficiency. Initially presenting a single navigation point to simplify interaction, EvolveUI systematically expands, introducing more features and navigation points as users become more adept at interacting with the interface. EvolveUI builds upon previous adaptive user interface research, but uniquely focuses on expanding functionality based on user proficiency, offering a tailored experience that aligns with individual learning curves. This project extends previous research by implementing and evaluating a Model-based planning approach using Monte-Carlo Tree Search (MCTS) to decide on which sequence of features to introduce next to the user, and a neural network to feed learnings from other similar low-literacy users. We present an evaluation from a user study which compares EvolveUI approach with conventional designs through usability tests on a mobile health application. Our evaluation results show that System Usability Scale (SUS) scores for our target group improved by as much as 30-40% using EvolveUI.

Awards Won: