"The best way to have a good idea is to have lots of ideas."
Linus Pauling

Two complementary actions form the core of any design activity: generating multiple possible solutions to a problem and selection of desirable solutions from that set.

Professional designers routinely build multiple prototypes to develop a more complete understanding of a design space. Historically, design tools have focused on the design of single artifacts. Software tools should support lightweight and rapid experimentation with alternative design options. However, such solutions do not yet exist for designing interactive behavior.

Our research introduces novel techniques to explore and manage sets of alternative interaction designs.

In the JustPose source editor (left), users access alternatives through tabs (A). The linked edit checkbox sets whether text modifications affect all alternatives or just the presently active alternative (B). Code that is not shared by all documents is highlighted with a colored background (C). Code annotations can transmit information to the runtime interface (D). In the runtime interface (right), code alternatives are executed in parallel (E). Designers select variables to tune from a list extracted from the currently running application (F). Control widgets change variable values in real-time. Whether tuning affects one or all alternatives can be switched with the linked tuning checkbox (G). Parameter settings can be saved and restored from snapshot palettes (H). Application variables can be tuned using either software or hardware controls.

The benefits of JustPose are amplified for development off the desktop, where the cost of write-complete cycles is much higher. Mobile phones are commodity hardware, and mobile developers already test on multiple handsets. We extended JustPose to leverage these device collections by executing different alternatives on different handsets. Alternatives are authored on the PC, and the compiled applications are then distributed to a collection of handsets. A designer can thus rapidly switch between alternatives by pulling one device down and picking another one up.

Embedded microcontrollers are the tool of choice for working with sensors and actuators. Building custom hardware is expensive, so designers often evaluate multiple alternative interconnections at the same prototype. JustPose for Arduino exports and runs only one code alternative on one attached board at a time. When the designer switches between alternatives, JustPose then transparently replaces the binary running on the microcontroller.