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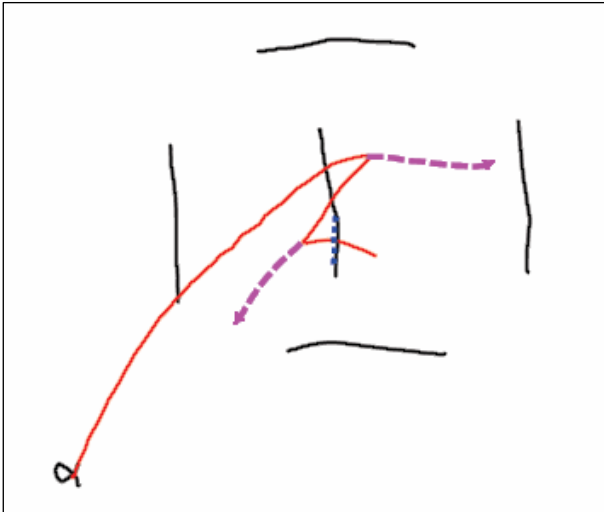INFO 498A
Final Project – Sketches

**Interaction Technique 1: "Scratch That!"**

Behavior: To activate a target, a user must cross the goal 3 consecutive times, creating a scratch-like behavior.

Pros: Unintentional goal activations might be reduced because this technique requires very deliberate movements.

Cons: The technique takes more effort and time than other interaction techniques. This technique might not be good for users that have "shaky" or tremor-like movements.

**Interaction Technique 2: "Cross Loop"**
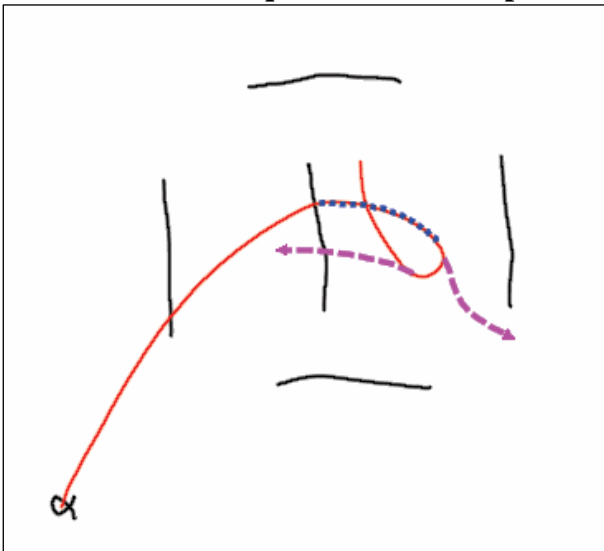
Behavior: To activate a target, a user must cross their own path after crossing a target. While the sketch looks like a gesture, this technique is not gesture-based. To exit, a user can cross another target or take a path that does not cross their original path.

Pros: This method could be easily extended to create additional actions, e.g. double-clicking, based on the direction of the cross.

Cons: Unintentional activations may be a problem since crossing one's path is very common. If crossing one's path is all that is needed, a change of direction to the user might easily trigger an action. This might be overcome by having the area of the created polygon be criteria to determine a goal activation, but this is getting into another technique.

## Interaction Technique 3: "Criss Cross Loop"
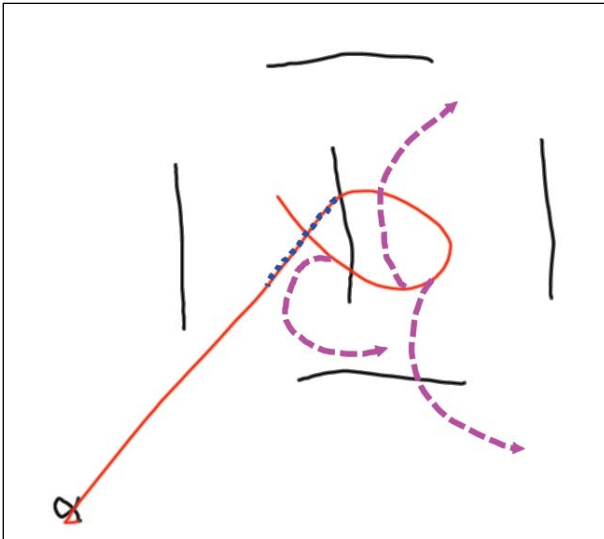
Behavior: This technique is similar to technique 2, but modified with an extra conditional: the user must cross their original path after re-crossing the goal.

Pros: Having two criteria (recrossing the goal and crossing user's path) reduces the likelihood for unintentional goal activations.

Cons: Like in technique 2, if a user simply changes directions, this might trigger unintentional goal activation.

Interaction Technique 4: 90 Degrees
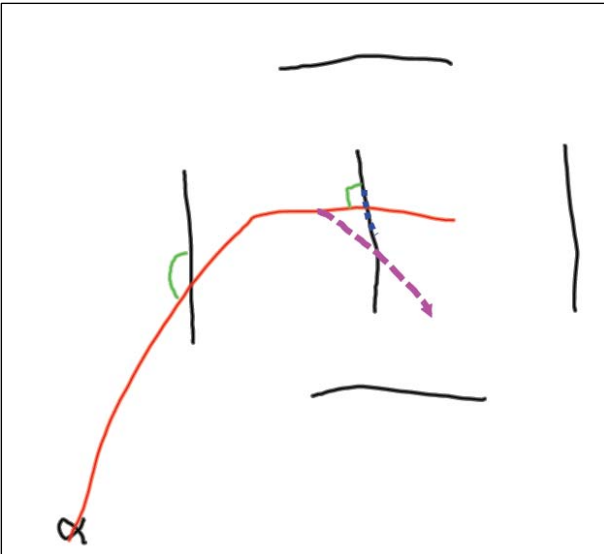
Behavior: In this technique a user must cross a goal at 90 degrees for it to be activated.

Pros: There is nothing really fancy about this technique, which makes it easy to implement and easy for user's to understand.

Cons: Hard for users to visualize and think about angles, which would increase the likelihood for unintentional goal crossings. Also, it's difficult to make EXACT 90 degree angles, so there would be to some range, like 85-95 degrees.

Interaction Technique 5: "Cross & Stop"
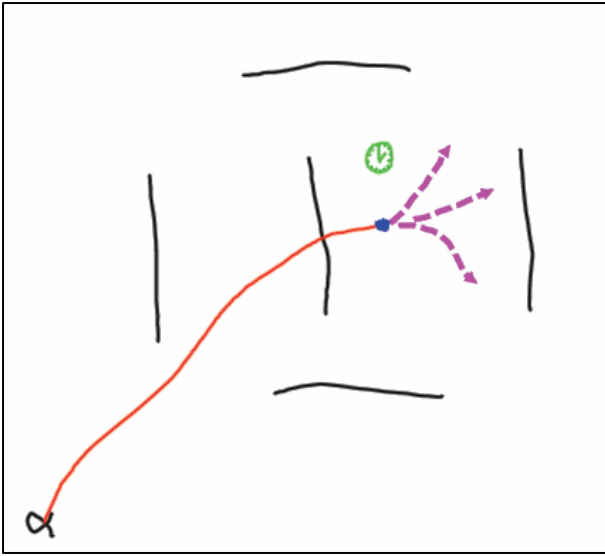
Behavior: Once a target has been crossed, a timer (set to a few seconds) is started. If pointer movement is below a certain threshold while the timer is running, a goal crossing event is registered when the timer is up.

Pros: The user may naturally stop moving for a moment when the target goal is crossed. Movement over distracter goals is ignored if there is continuous motion.

Cons: Any technique involving timing introduces unnatural delays and may feel awkward. Even if adjustable, the delay would be difficult to optimize. How much motion should be allowed while the timer is running? Accidental activation is possible if user is distracted.

**Interaction Technique 6: "Second Target"**
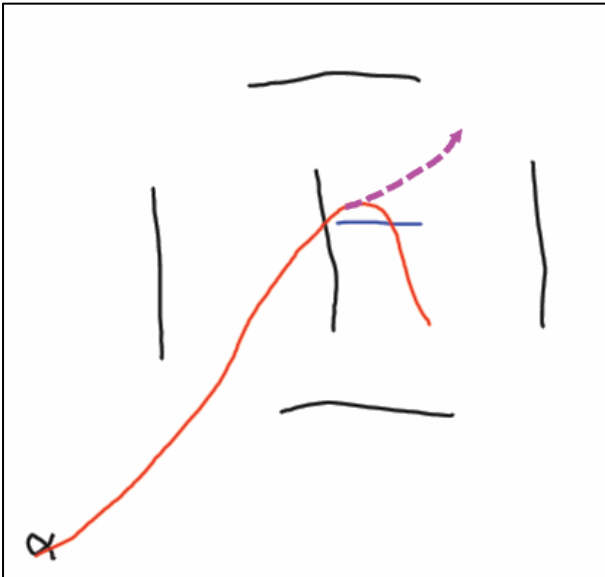
Behavior: At the instant a target is crossed, a new target goal is created perpendicular to the original target. If the user crosses this new target, the original target is activated. Failing to cross the new target after a certain amount of movement (or crossing another target) will cause the new target to disappear.

Pros: Appearance of the new goal should encourage users to cross it. Users are unlikely to accidentally cross the goal if they continue to move in the same direction through a distracter goal.

Cons: This technique may require a relatively quick decision, and accurate directed movement after the initial goal is crossed. Crossing very close to the end of targets may cause problems with the location of the new goal.

Interaction Technique 7: "Flip Switch"
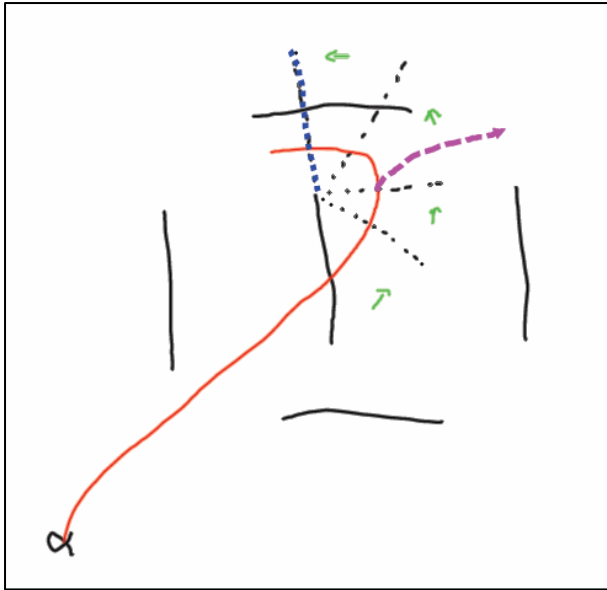
Behavior: A target is selected when crossed and other targets are deactivated until the current target is unselected. After selection, the target attaches to the pointer and pivots counter-clockwise creating a half circle pathway. At any point, the target can be deselected by exiting the half circle from its outer curve. The target is activated when it reaches 180 degrees from its initial position.

Pros: The analogy of a switch allows intuitive feedback on the target's status.

Cons: The half-circle pathway may prove too difficult for consistent activation.

## Interaction Technique 8: "Gravity Well"
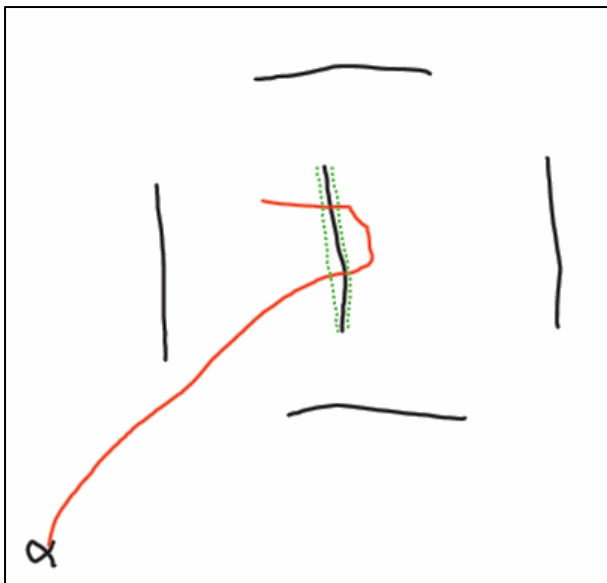
Behavior: The targets are surrounded by "gravity fields" that accelerate the pointer towards the targets, making them easier to cross. A target is activated by crossing it twice within a timeframe.

Pros: Very simple. Gravity could help people with motor impairment to cross the targets.

Cons: Gravity could lead to unintentional target activation. Also, a large timeframe between the crosses could lead to an increase in unintentional activations and a short timeframe could make activation overly difficult.

## Interaction Technique 9: "Escape the Tunnel"
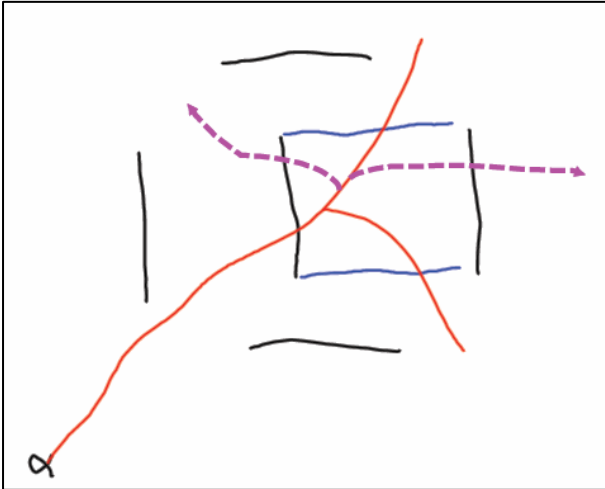
Behavior: This technique is a refinement of technique 6. Instead of a single additional perpendicular target, two are created – one at each end of the original target, forming an open "box." If the user crosses either of these new targets, the goal is activated. The user exits if they cross the original goal, cross a new goal, or exit the box.

Pros: Since two new goals appear, it's easier to activate the target. Different functionality (e.g. double-clicking) could be performed depending on the second goal chosen

Cons: The appearance of two new goals may cause confusion. Distracter targets may be too easily activated accidentally.

Interaction Technique 10: "Mountains"
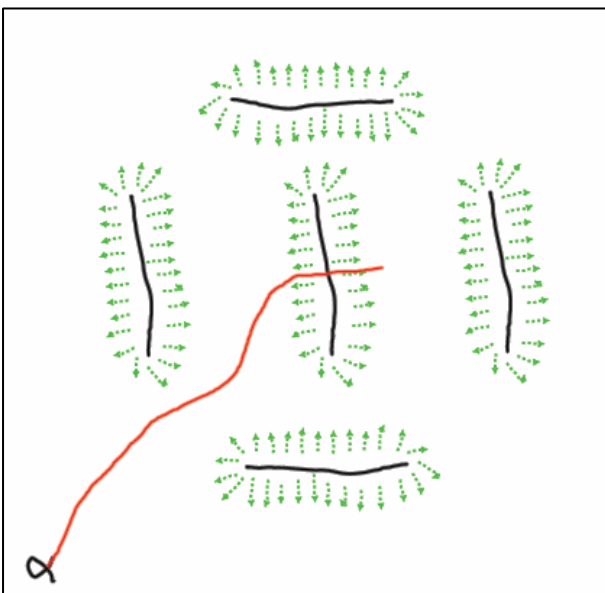
Behavior: The targets are surrounded by gravity fields that actively push the pointer away from the targets. A target is activated by crossing it once.

Pros: This is a relatively fast method due to the single crossing. The gravity away from the targets could reduce the occurrence of unintentional activations.

Cons: While single crossing is simple and fast, it could produce much unintentional activation. Also, by making the targets harder to cross, motor impaired users may find the task too difficult.