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**Algorithm 1** Main Exploration Loop

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1: function START(input_manager)
2:    $count \leftarrow 0$ 
3:   while  $count < max\_event\_count$  do
4:     Update UI state and snapshots
5:     Start the APP if essential
6:     if LLM mode is active then
7:       if Continuing LLM Sequence then
8:         Build Next Action Prompt
9:          $response \leftarrow CallLLM()$ 
10:         $response \leftarrow ValiditByLLM()$ 
11:         $act \leftarrow ParseAction(response)$ 
12:      else
13:        Build Meaning Prompt
14:         $r_1 \leftarrow CallLLM()$ 
15:        Build Task Prompt
16:         $r_2 \leftarrow CallLLM()$ 
17:        Build First Action Prompt
18:         $r_3 \leftarrow CallLLM()$ 
19:         $response \leftarrow ValiditByLLM()$ 
20:         $act \leftarrow ParseAction(r_3)$ 
21:      end if
22:      Set LLM Mode to  $act.hasNext$ 
23:       $event \leftarrow WrapAsU2Event(act)$ 
24:    else if Detect( $last\_state\_xml, current\_state\_xml$ ) then
25:      Activate LLM Mode
26:      Follow same steps as above to generate  $event$ 
27:    else
28:       $event \leftarrow RandomGenerate(from\_state)$ 
29:    end if
30:    Execute( $event$ )
31:     $count \leftarrow count + 1$ 
32:  end while
33:  Clean up and exit
34: end function
```

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