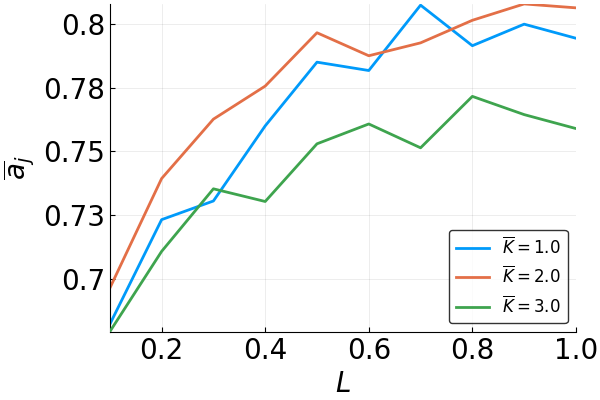
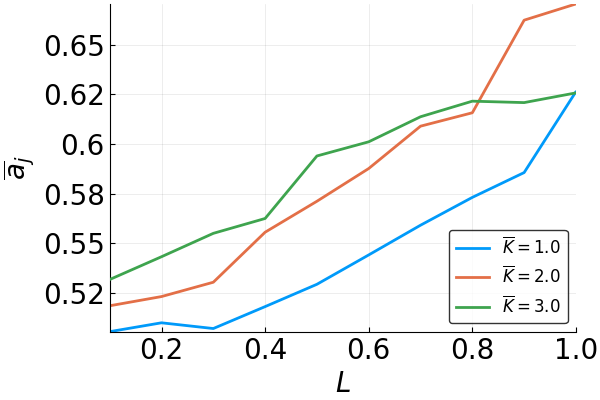
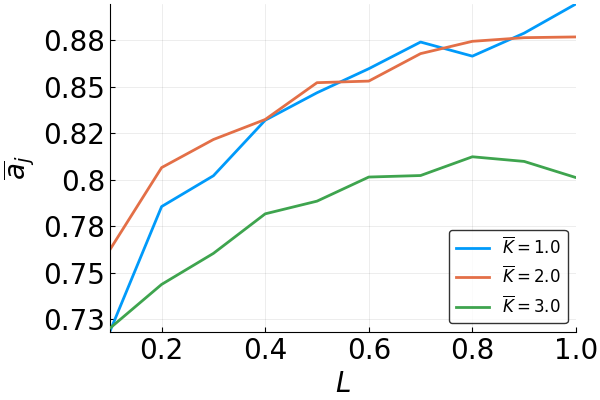
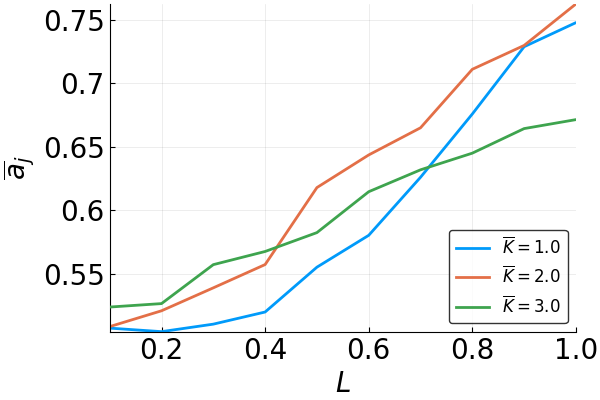
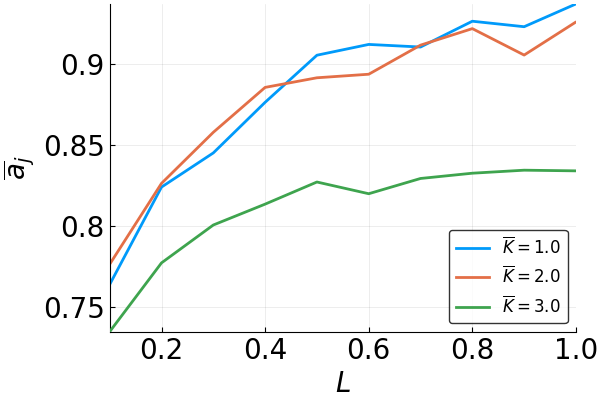
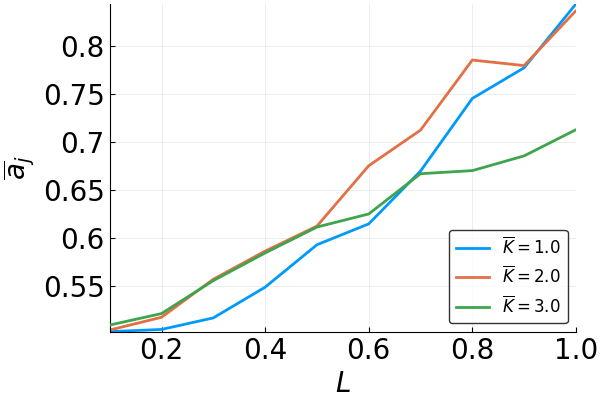
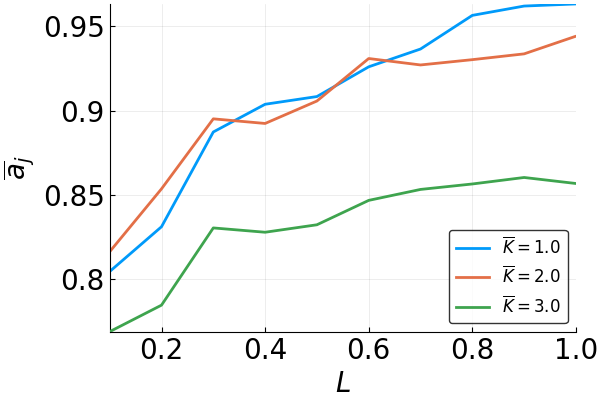
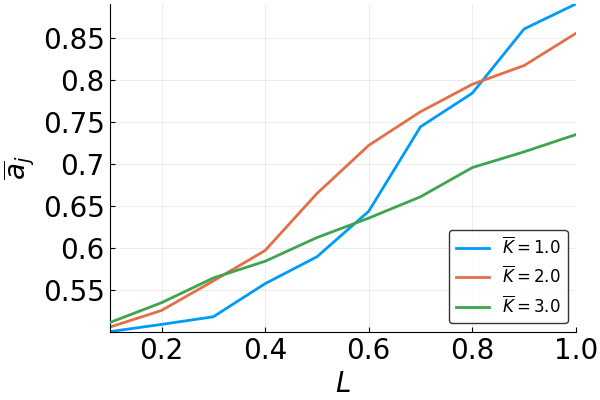
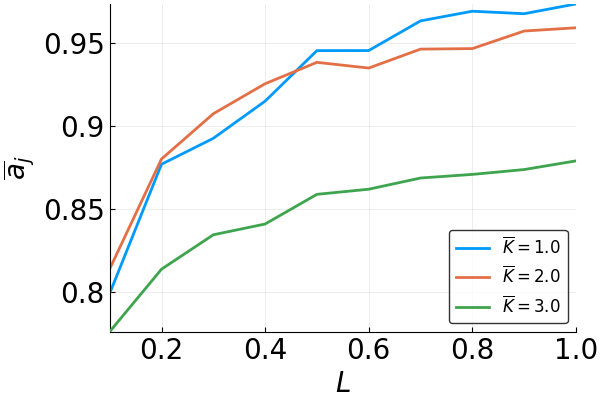
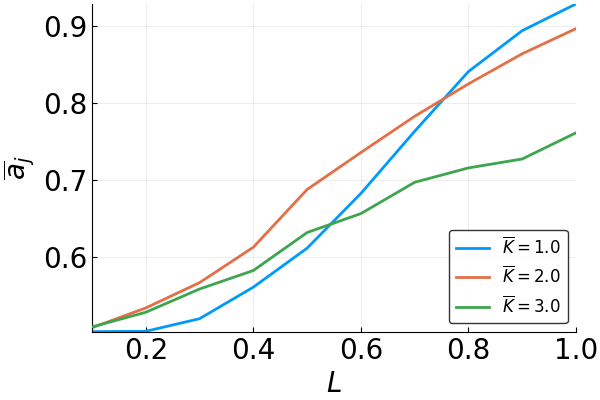
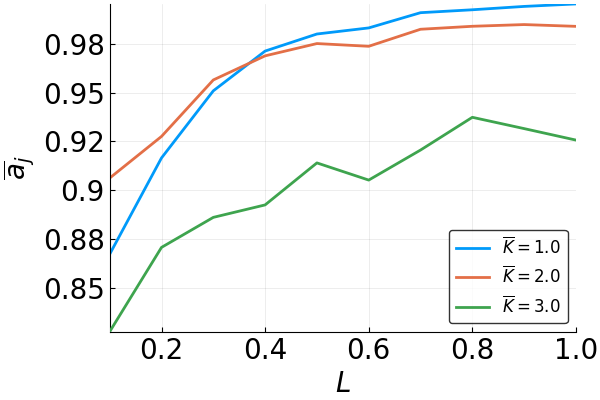
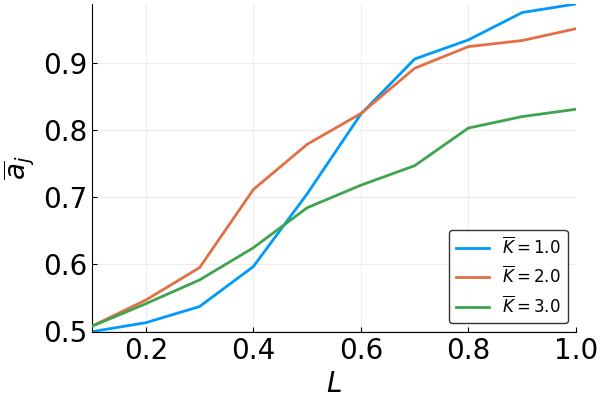
## Supplementary Materials

**Flexibility of Boolean Network Reservoir Computers in Approximating Arbitrary Recursive and Non-recursive Binary Filters**

(A)(B)

(C)(D)(E)(F)(G)(H)(I) (J)(K)(L)

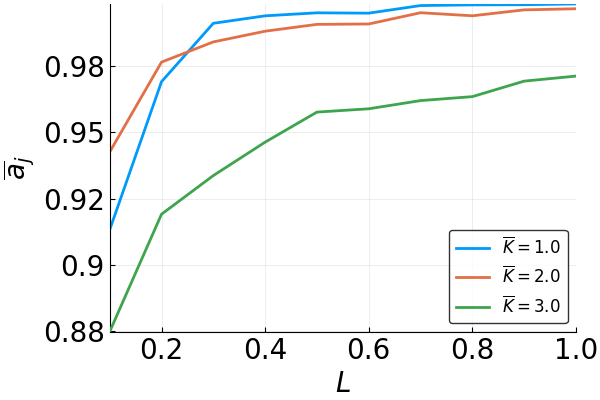
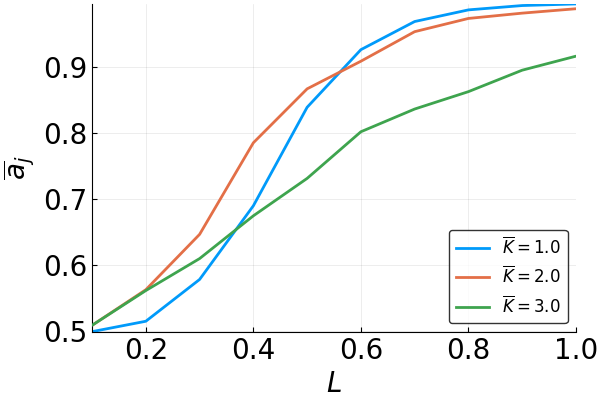
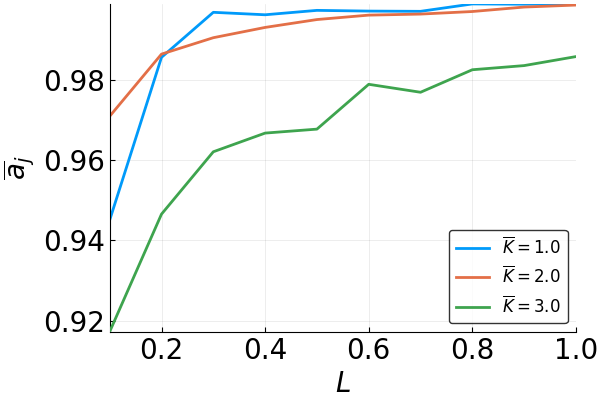
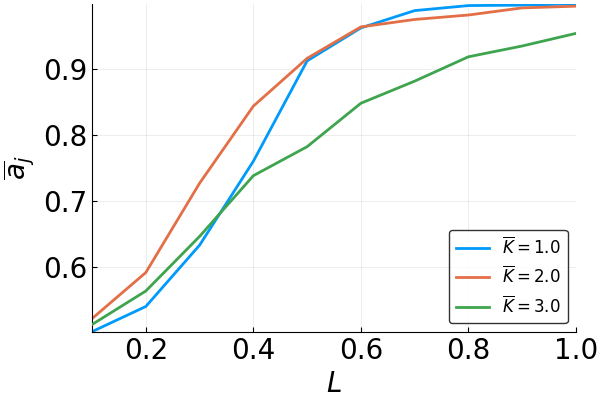
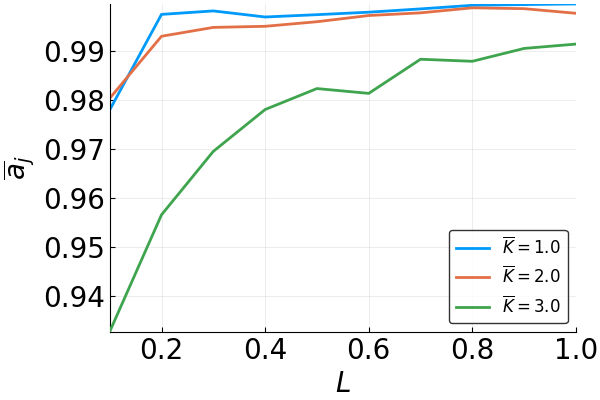
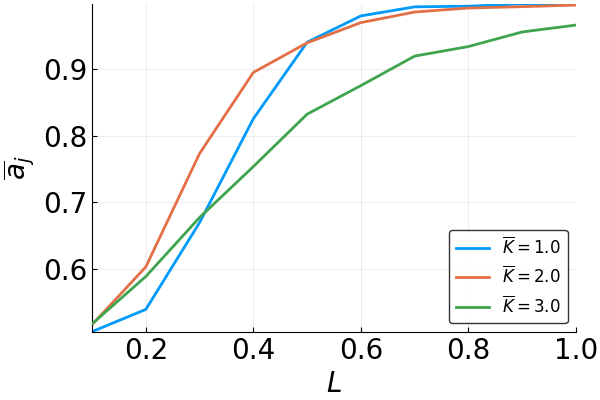
(M)(N)(O)(P)(Q)(R)

Figure S1. Mean accuracy, vs for the 3-bit median(Left Column) and parity(Right Column) functions for different -valued reservoirs with = 10,20,30,40,50,100,200,300,400.

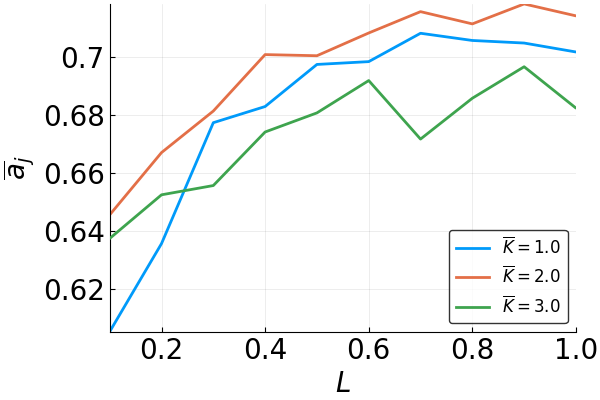
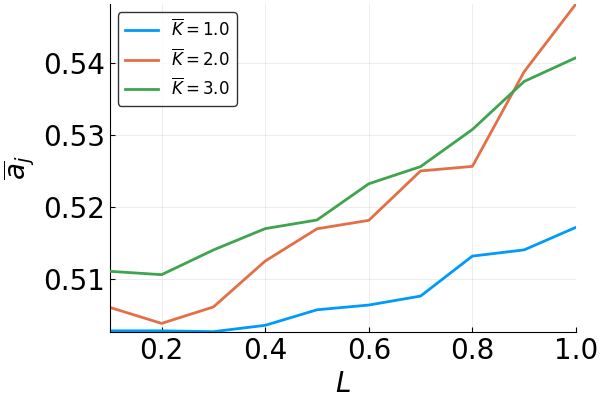
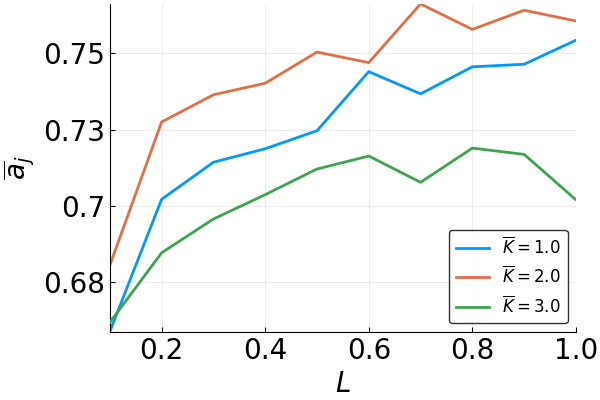
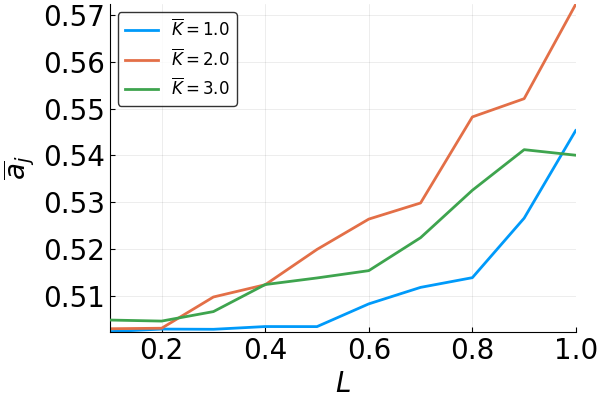
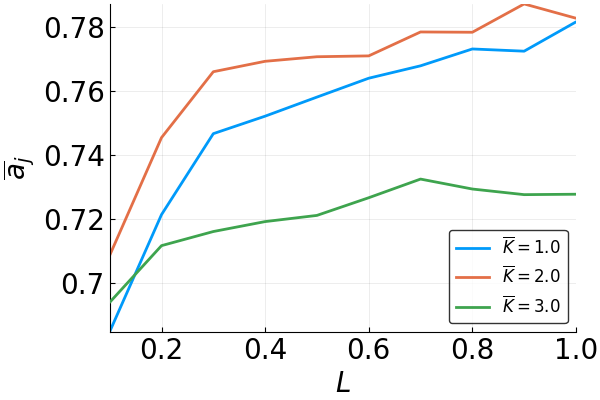
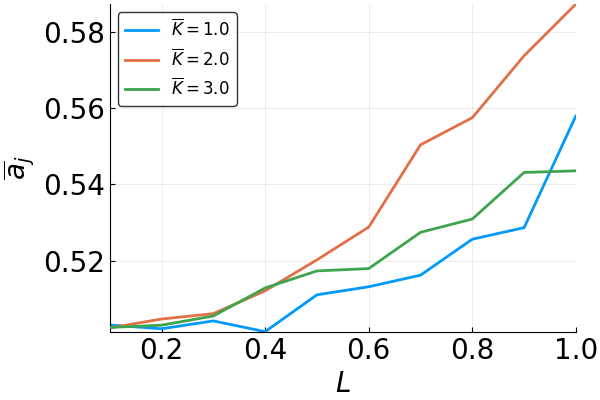
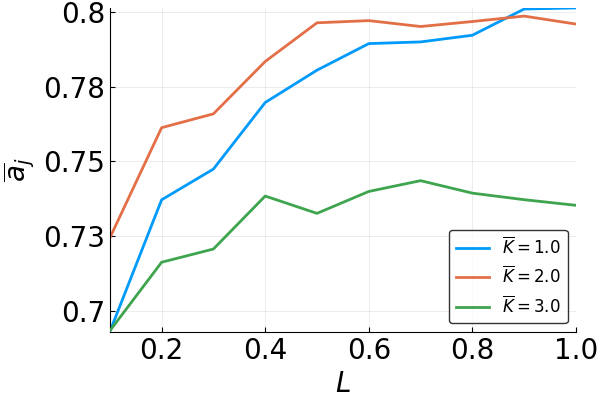
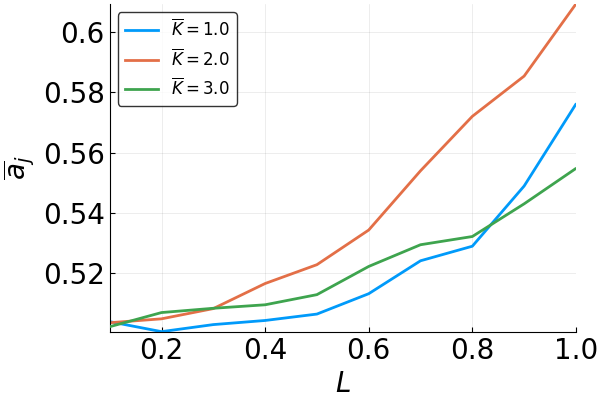
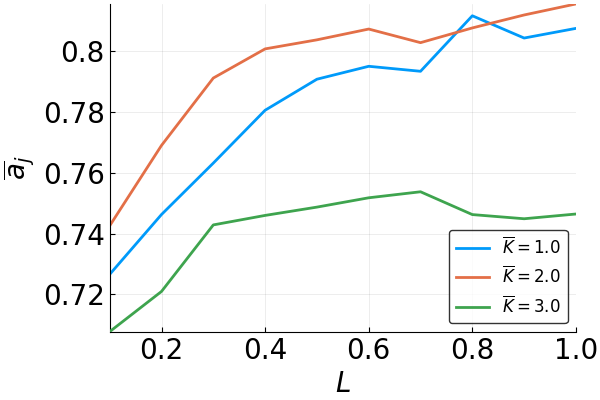
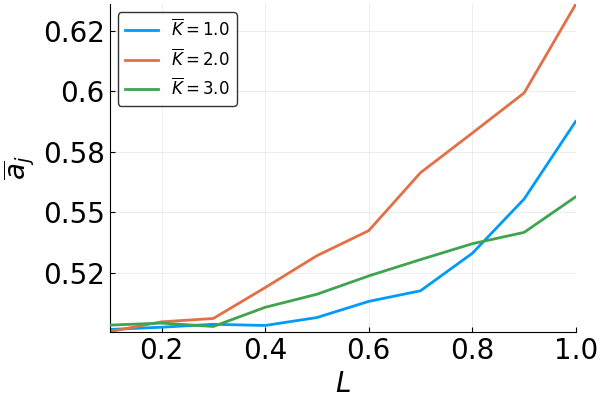
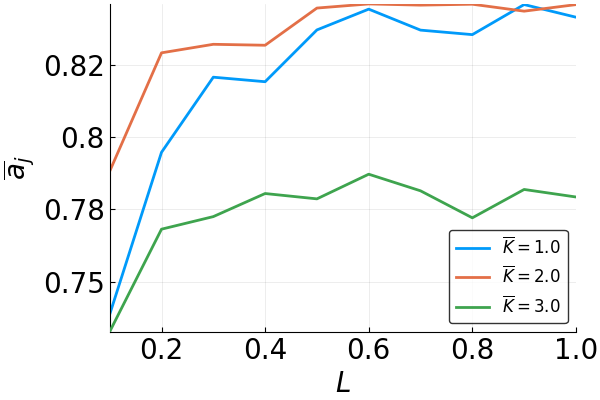
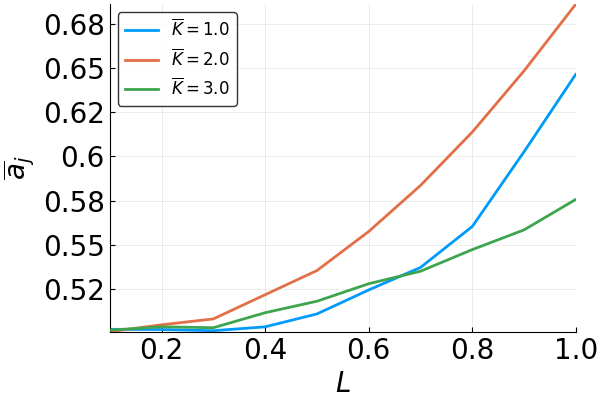
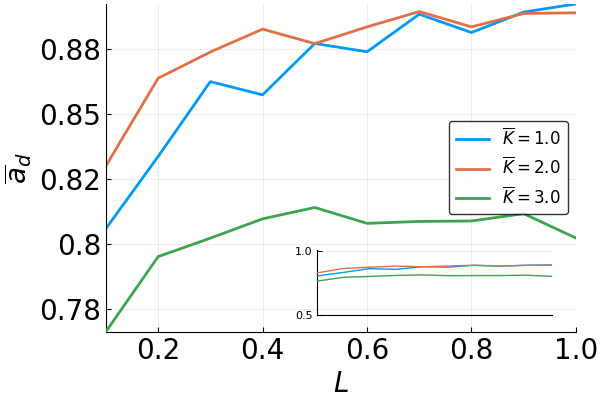
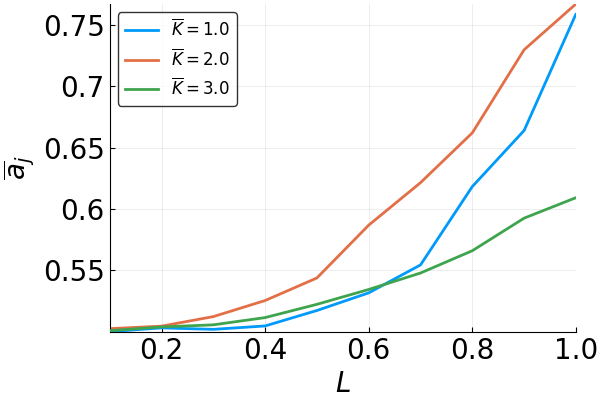
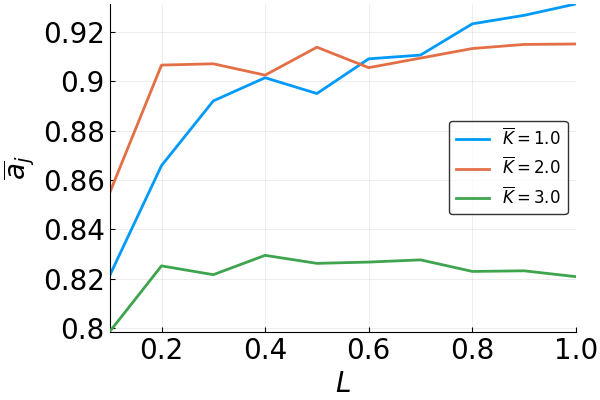
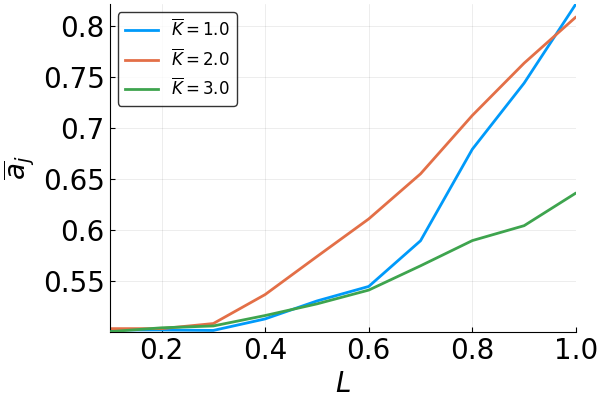
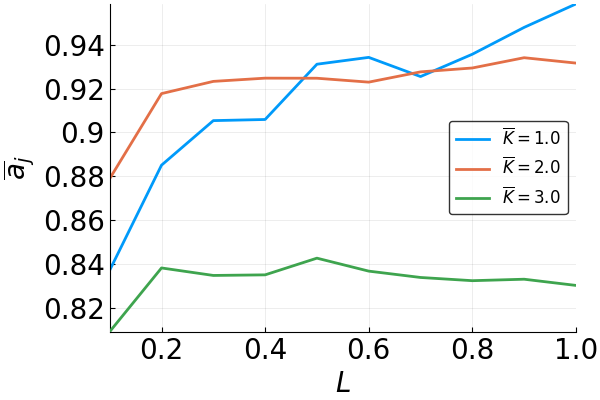
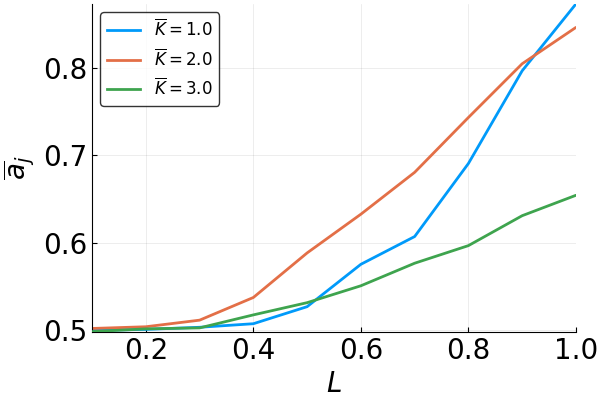
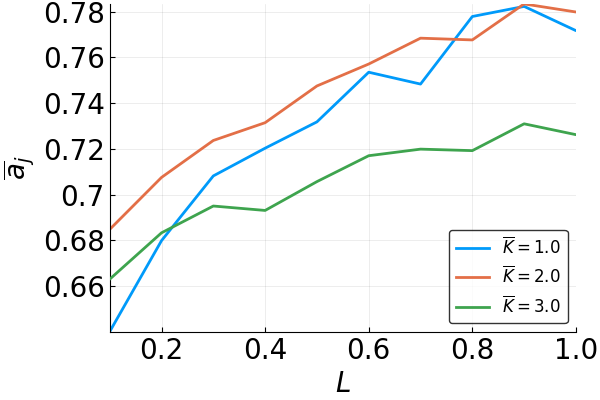
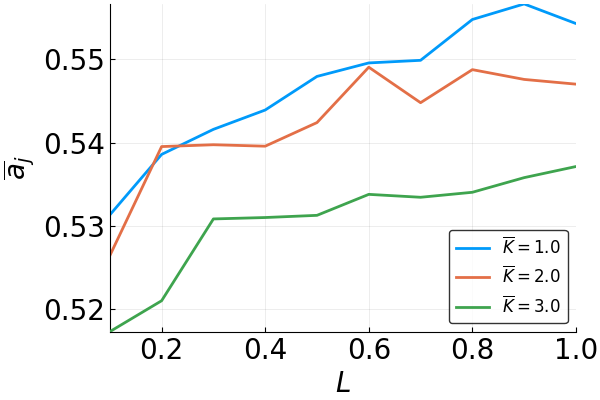
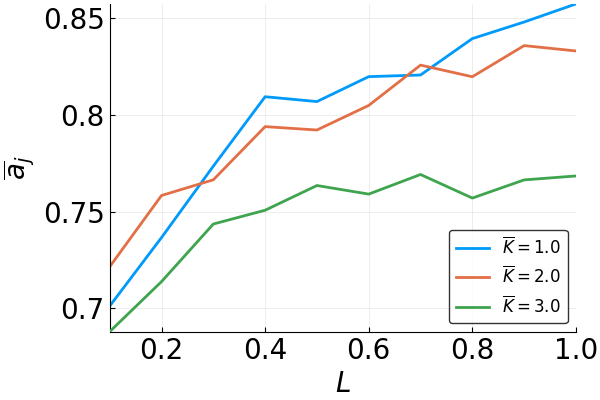
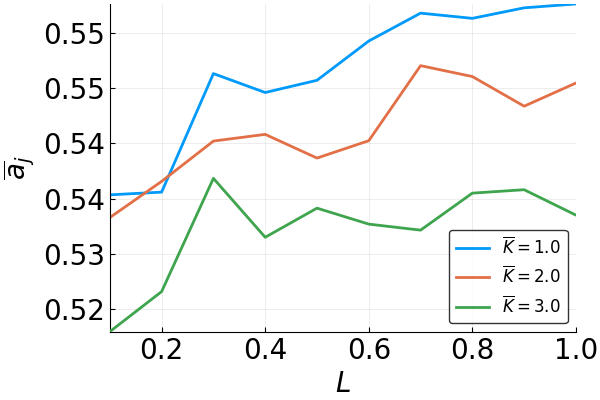
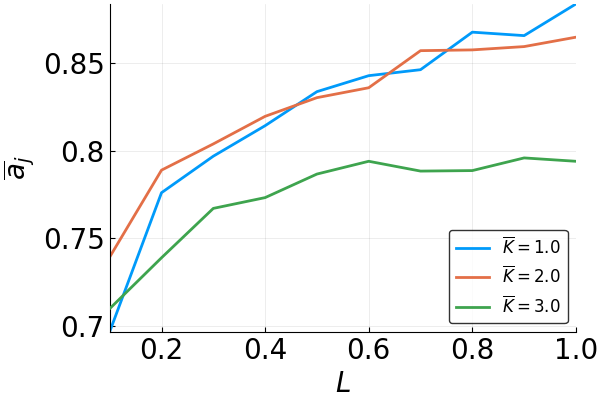
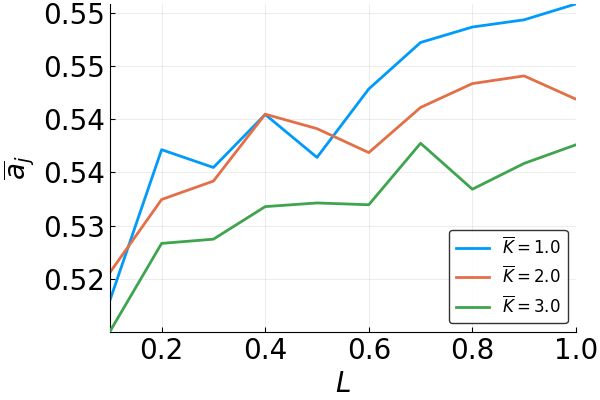
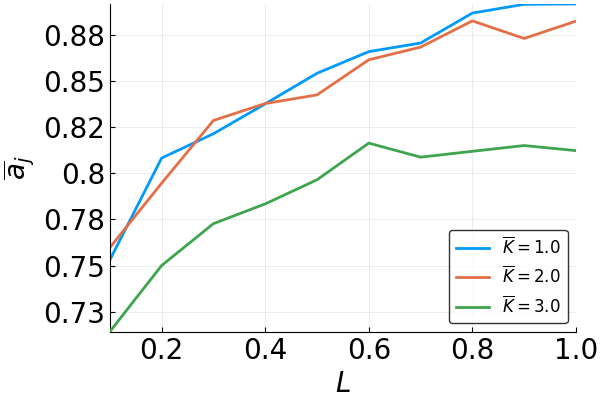
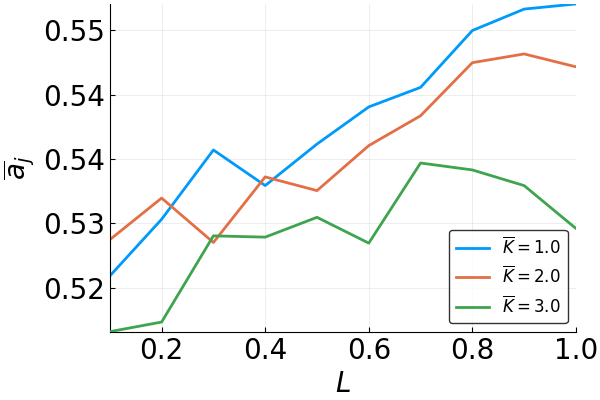
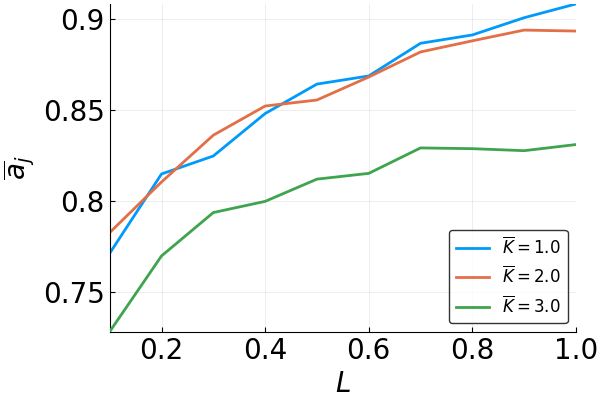
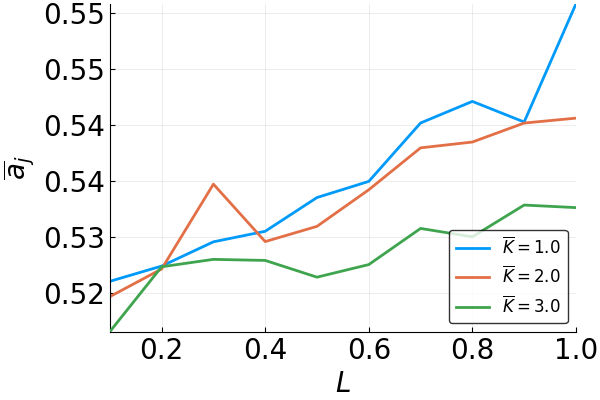
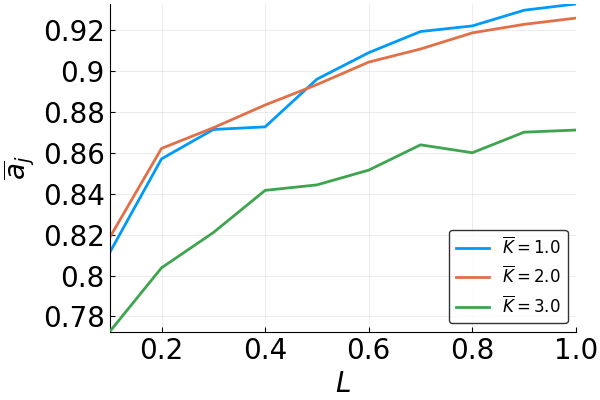
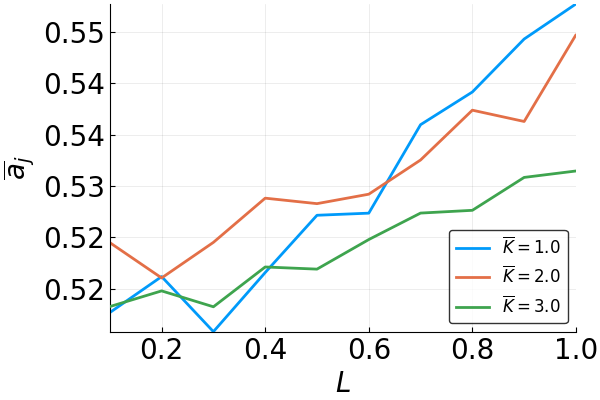
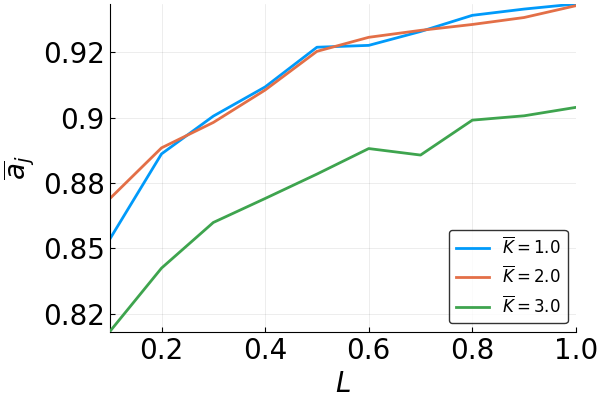
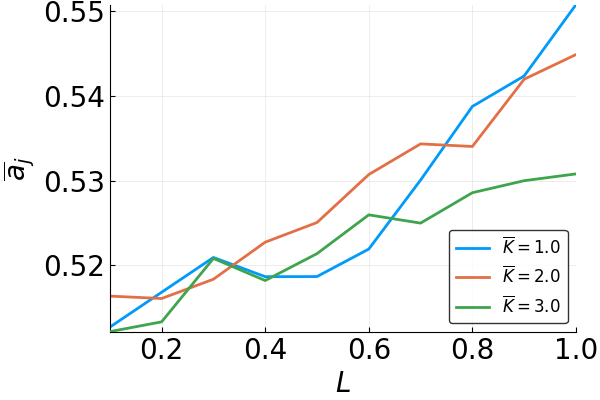
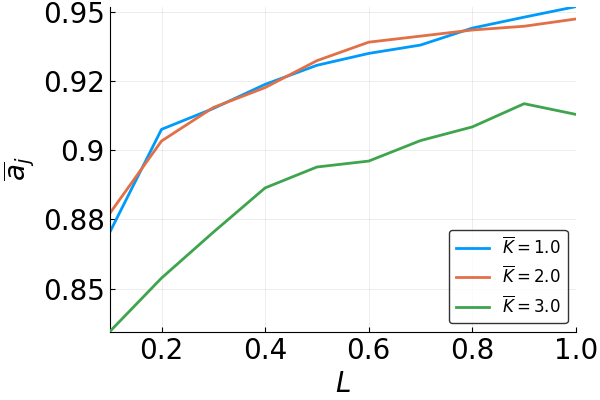
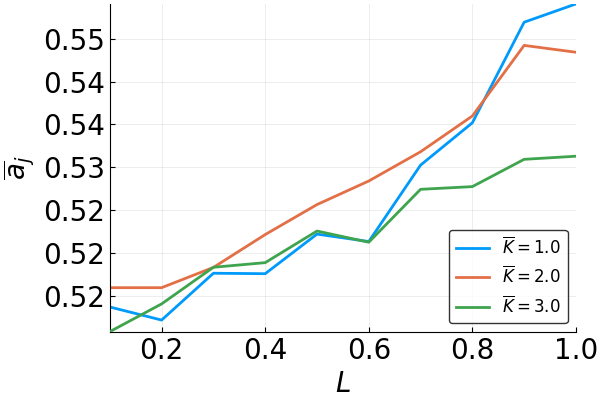
(A)(B)(C)(D)(E)(F)(G)(H)(I) (J)(K)(L)(M)(N)(O)(P)(Q)(R)

Figure S2. Mean accuracy, , vs for the 5-bit median(Left Column) and parity(Right Column) functions for different valued reservoirs with = 10,20,30,40,50,100,200,300,400.

(A)(B)

(C)(D)(E)(F)(G)(H)(I) (J)(K)(L)(M)(N)

(O)(P)

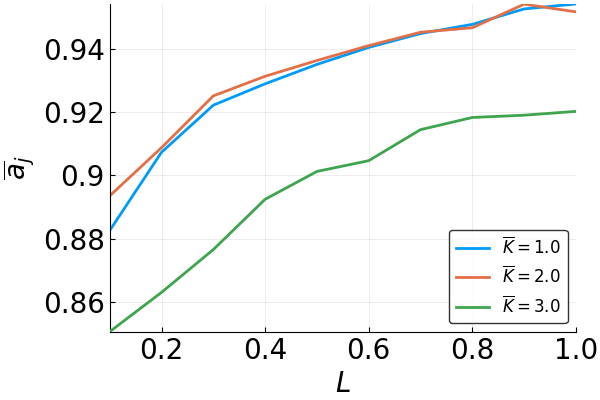
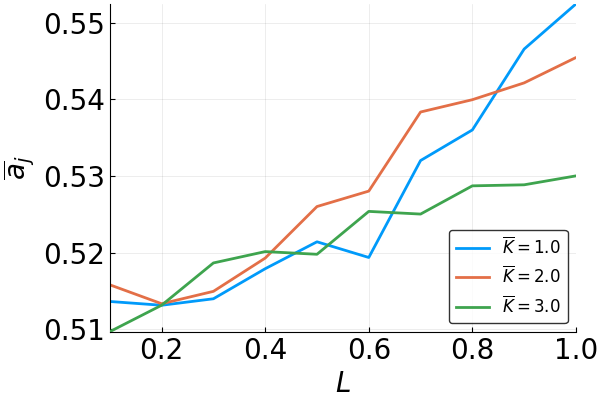
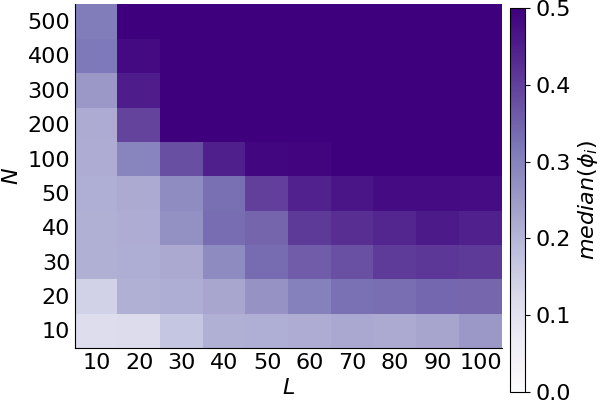
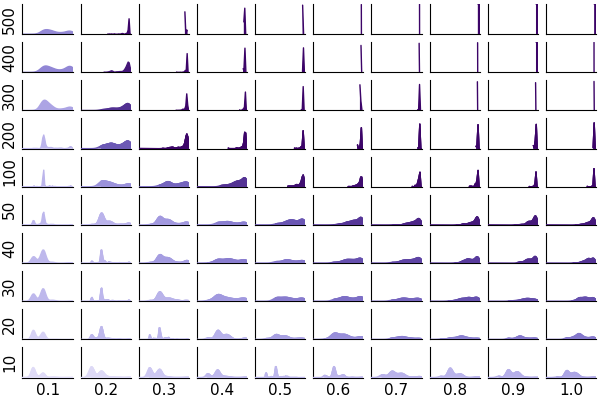
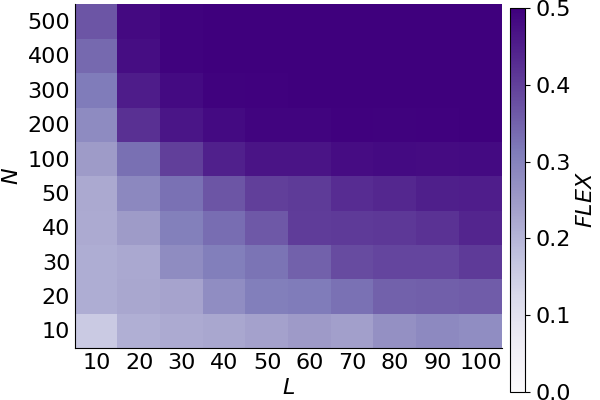
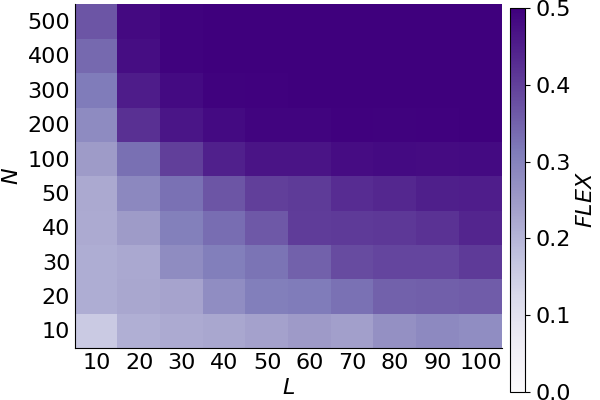
(Q)(R)

Figure S3. Mean accuracy, , vs. for the 3-bit recursive median(Left Column) and parity(Right Column) functions for different -valued reservoirs with

= 10,20,30,40,50,100,200,300,400.

(A)



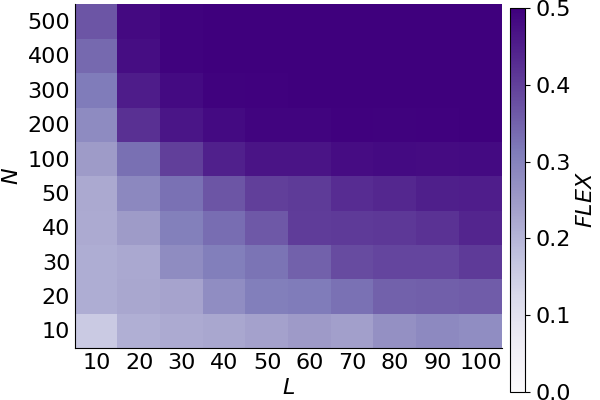
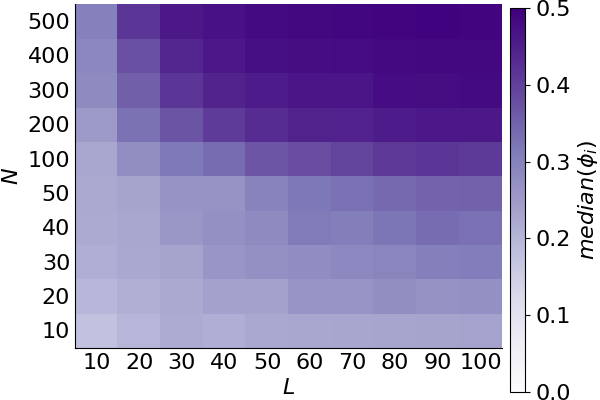
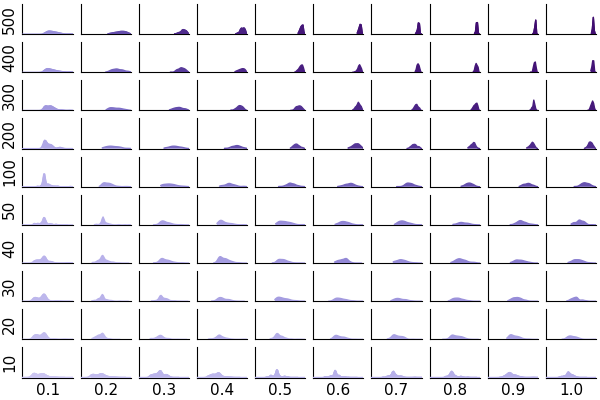
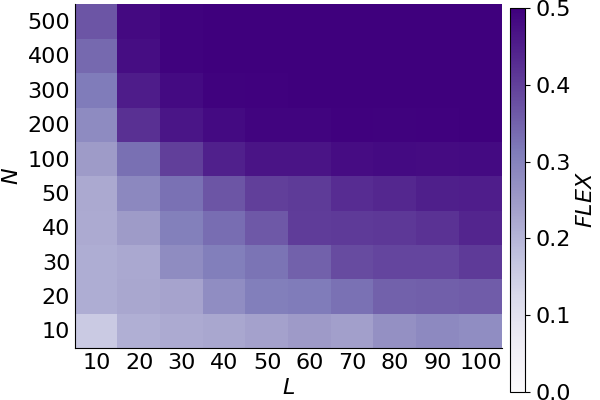
(B)

Figure S4. Histogram of across all 100 reservoirs for each with = 1(A),= 3(B) for 3-bit functions. Each subplot represents the density for all the reservoirs with one and , with the x-axis being and the y-axis being number of reservoirs[0,256].

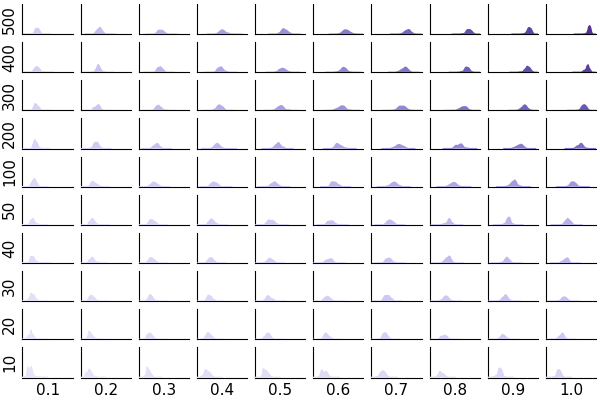
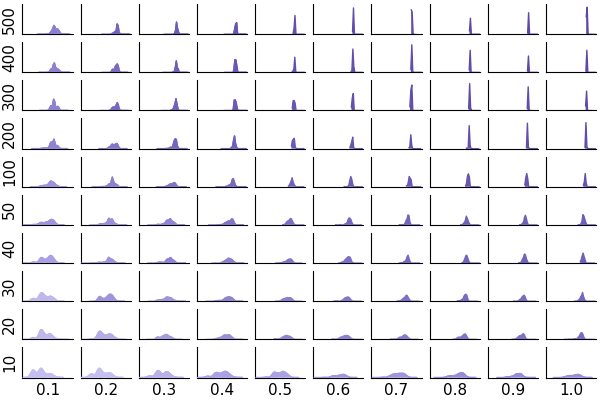
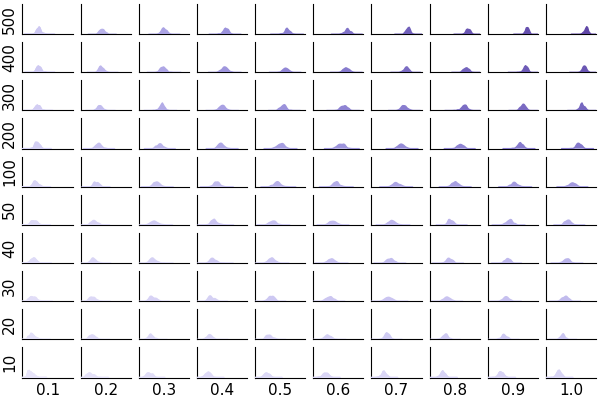
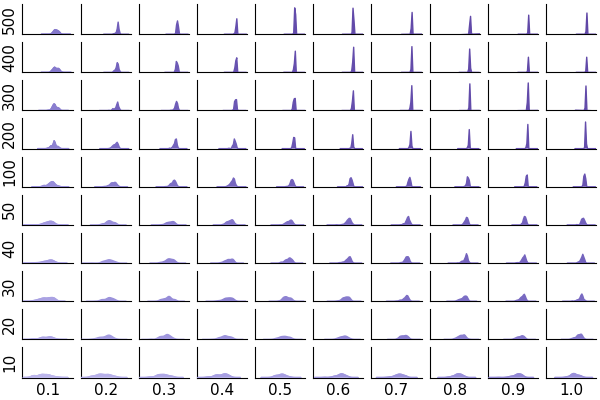
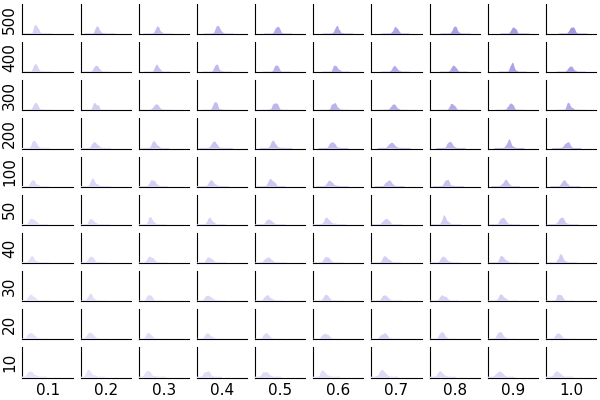
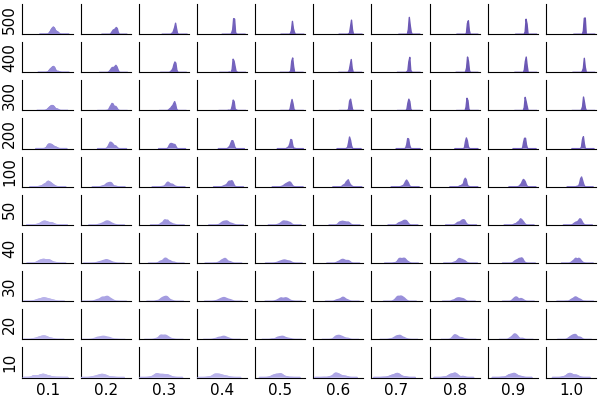
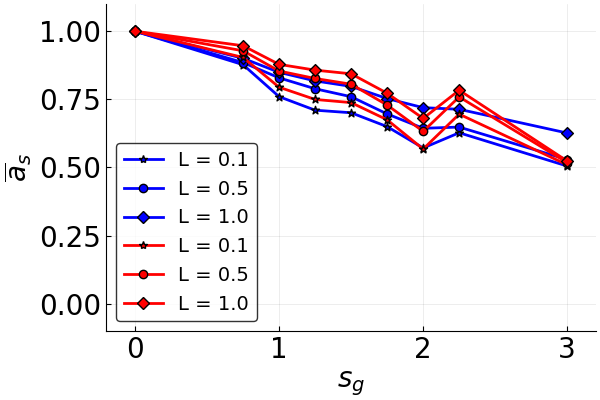
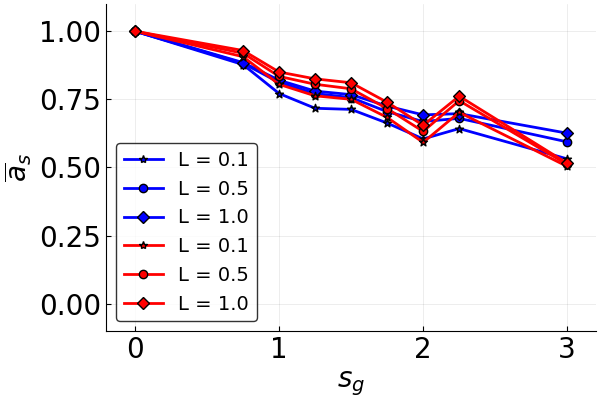
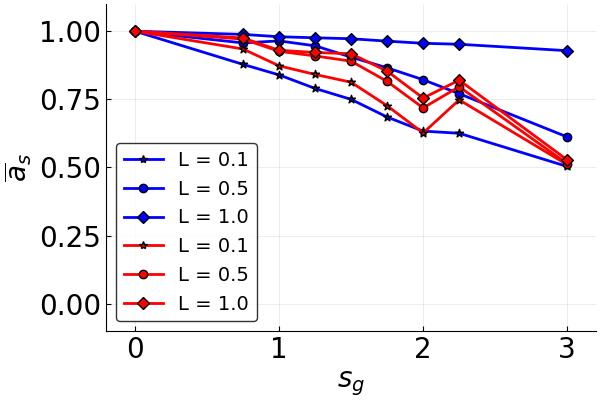
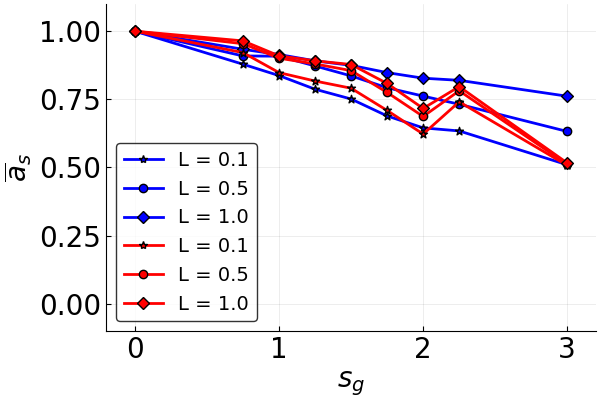
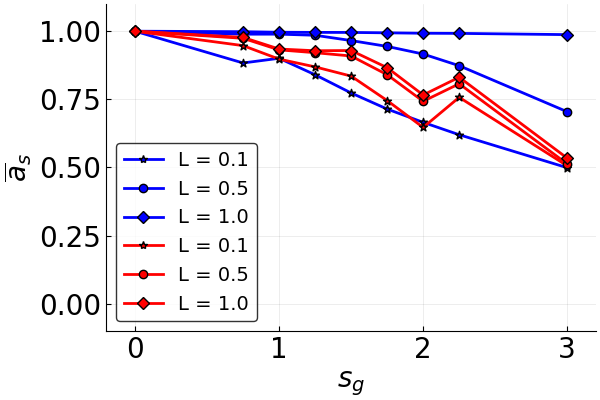
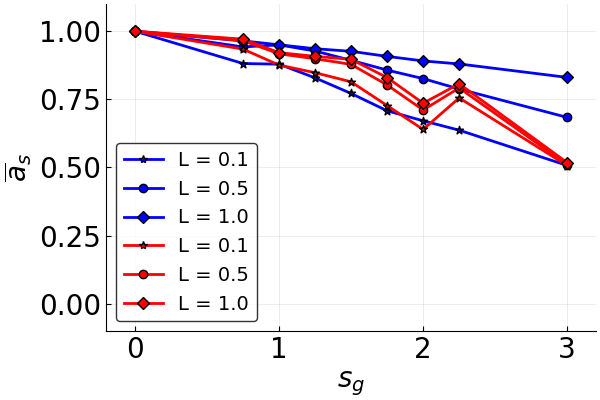
(A)(B)(C)(D)(E)(F)

Figure S5. Histogram of across all 100 reservoirs for each for 5-bit functions (Left column) and recursive 3-bit functions(Right column). Reservoirs with the three values of are shown: = 1 in row 1, = 2 in row 2, and = 3 in row 3.Each subplot represents the density for all the reservoirs with one and , with the x-axis being and the y-axis being number of reservoirs.

(A)(B)(C)(D)

(E)(F)

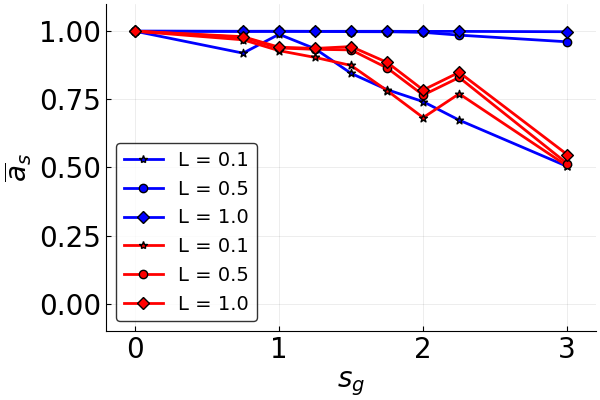
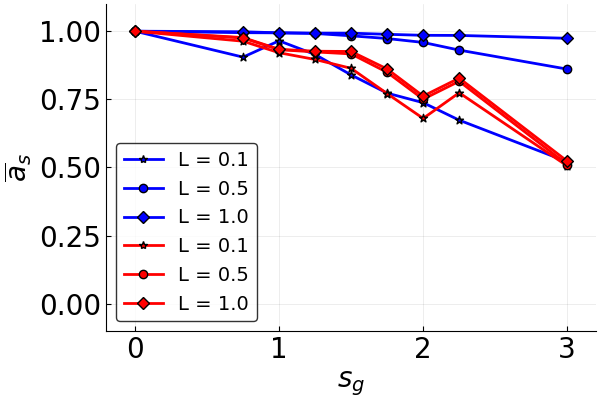
(G)(H)

Figure S6. Mean accuracy, , vs. function average sensitivity, . 3-bit functions shown in blue and recursive 3-bit functions shown in red with = 0.1 (stars), 0.5(circles), 1(diamonds). Four different values for are shown. Each row shows a different value of , from top to bottom

= 10, = 50, = 100, = 500. Columns show = 1 (Left) and = 3 (Right).

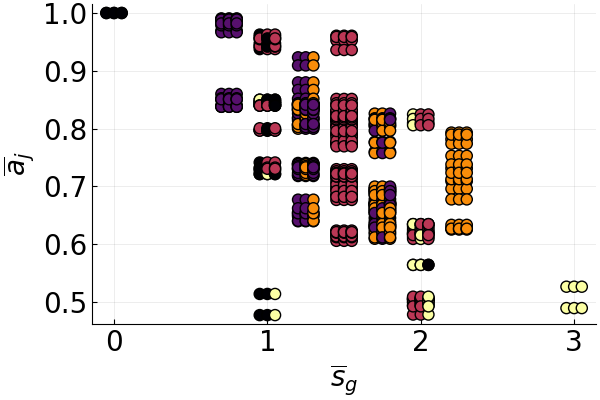
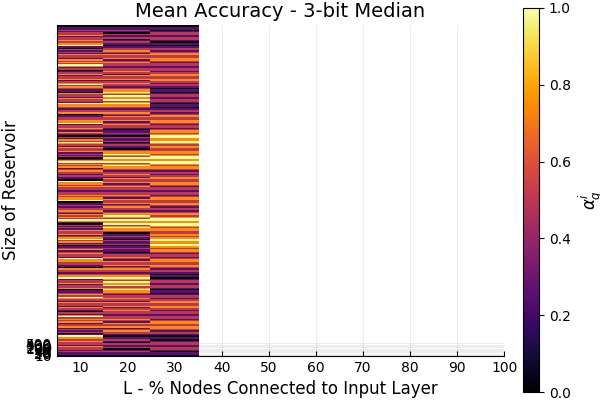
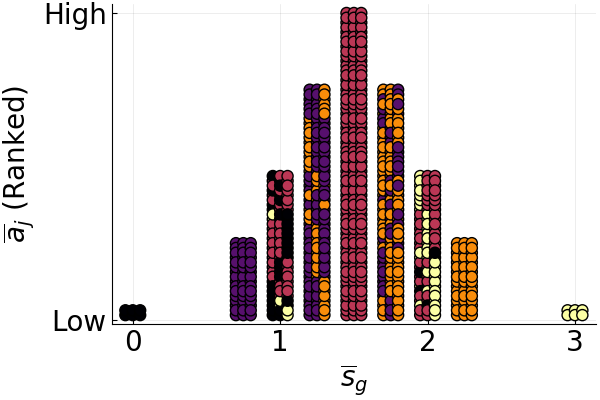
(A)(B)

Figure S7. Example of mean function accuracy vs. average sensitivity with activities of each variable displayed. Data shown is for recursive 3-bit functions- = 10, = 0.1, and = 2. (A) Each function is visualized as a horizontal triplet of circles, where each circle corresponds to a variable (left to right,,,), colored by its activity. (B)In order to more clearly see the relationship between distribution of activity and accuracy, functions are plotted by ranked accuracy rather than absolute accuracy.