def $bisectionEXP(left, right):$

$P_L, P_R = P_{opt}(left), P_{opt}(right)$

$if\ (left \leq right)\ and\ (P_L\ != P_R):$

$mid = \frac{left+right}{2}$

$P_M = P_{opt}(mid)$

$if\ (P_L != P_M):$

$bisectionEXP(left,\ mid)$

$if\ (P_R != P_M):$

$bisectionEXP(mid,\ right)$

def $AdaNEXUS(CC_i)$:

$S_{now},\ P_{now} = InitializeSeed(CC_i)$

$C_{now} = Cost(P_{opt}, S_{now})$

$step,\ \Delta_{now} = 1\ ,\ [-1, 0]$

$while\ (There\ exist\ next\ point)$:

$S_{proxy} = S_{now} + step * \Delta_{now}$

$C_{proxy}, P_{proxy} = Cost(P_{opt}\ , S_{proxy})$

$S_{next}\ , \Delta_{next} = Correct(CC_i, C_{proxy})$

$C_{next}, P_{next} = Cost(P_{opt}\ , S_{next})$

$if\ (\max\left(\frac{C_{next}}{CC_i}\ , \frac{CC_i}{C_{next}}\right) \leq (1 + \alpha))$:

$\Delta_{now} = TuneDir(\Delta_{now}\ , \Delta_{next}\ , step)$

$bisectionEXP(S_{now}\ ,\ S_{next})$

$S_{now}\ , step = S_{next}\ , 2 * step$

$else$:

$if\ step > 1$:

$step = step\ /\ 2$

$else$:

$\Delta_{now} = Rotate(S_{now}\ , CC_i)$