$g(x) = cf(x)$ $\quad$ $c = \int_D g(x)dx \rightarrow D$ is domain of f

normalizing constant

ARS relies on the assumption of log-concavity of f

$h(x) = \ln[g(x)]$

↳ evaluate h and h' in k abscissae in D : $x_1 \leq \dots \leq x_k$

$T_k = \{x_i : i = 1, \dots, k\}$

Piece-wise Linear
Upper Hull $U_k(x) \leftarrow$ Tangents to $h(x)$ on T_k

$z_j = \dfrac{h(\dots) \quad \dots}{\dots}$ $\rightarrow$ z_0 lower bound of D
z_1 upper "

For $x \in [z_{j-1}, z_j]$ & $j = 1, \dots, k$

$U_k(x) = h(x_j) + (x - x_j) h'(x_j)$

Define $s_k(x) = \exp U_k(x) / \int_D \exp U_k(x')dx'$

Piecewise Linear Lower Hull $l_k = \dfrac{(x_{j+1} - x) h(x_j) + (x - x_j) h(x_{j+1})}{x_{j+1} - x_j}$

Rejection Envelop $\exp[U_k(x)]$
Squeezing Function $\exp[l_k(x)]$
$\Big\rangle$ Piecewise exp function

Initialization

→ Initialize abscissae in T_k

→ Calculate $U_k(x)$, $S_k(x)$, $l_k(x)$

Sampling

Sample x^* from $S_k(x)$

" w from Unif(0,1)

Perform the Squeezing Test

Updating

If $h(x^*)$ and $h'(x^*)$ have been evaluated in Sampling

include x^* in T_k to form T_{k+1}

Construct U_{k+1}, S_{k+1}, l_{k+1}

→ In general, 2 starting abscissae $(k=2)$ to be necessary and sufficient for computational efficiency