Method	Proposed method name in SciPy	Present in Runuran	Setup	Sampling	Requires								Other Requirements	Parameters	Parameter Name in SciPy	Other Parameters (Not Important)	Experimental Parameters	Methods	Method Name in SciPy	Notes
					PDF	DPDF	PMF	PV	CDF	Mode	Area	Sum								
Automatic Ratio-Of-Uniforms method	AutomaticRatioOfUniforms	Yes	slow	fast	Yes	Yes	N/A	N/A	No	Optional	No	N/A	T-Concave PDF	usedars max_aspratio max_segments cpoints usecdfmode guidefactor verify pedantic	use_dars max_aspratio max_segments cpoints usecdf guide_factor verify pedantic	darsfactor	N/A	aspratio hatarea squeezearea	aspratio (property) hat_area (property) squeeze_area (property)	
Adaptive Rejection Sampling	AdaptiveRejectionSampling	Yes	fast	slow	Yes	Yes	N/A	N/A	No	Optional	No	N/A	Concave logPDF	max_intervals cpoints max_iter verify pedantic	max_intervals cpoints max_iter verify pedantic	N/A	N/A	loghatarea invcdfhat	loghat_area (property) pdf_hat	
Hermite interpolation based INVersion of CDF	NumericalInverseHermite	Yes (advanced interface)	(very) slow	(very) fast	Optional	Optional	N/A	N/A	Yes	No	No	N/A	N/A	order u_resolution cpoints boundary guidefactor max_intervals	order u_resolution cpoints boundary guide_factor max_intervals	N/A	N/A	n_intervals approxinvcdf estimate_error	n_intervals (property) pdf estimate_uerror	
Inverse Transformed Density Rejection	InverseTransformedDensityRejection	Yes	moderate	moderate	Yes	Yes	N/A	N/A	No	Yes	No	N/A	monotone PDF pole	xi cp cdf verify	xi cp cdf verify	N/A	N/A	xi cp cdf area	xi (property) cp (property) cf (property) area (property)	
Numerical INVersion	NumericalInversion	Yes (advanced interface)	optional	(very) slow	Optional	No	N/A	N/A	Yes	No	No	N/A	N/A	method max_iter x_resolution u_resolution start table	method max_iter x_resolution u_resolution start table	N/A	N/A	approxinvcdf	pdf	
Naive Ratio-Of-Uniforms method	NaiveRatioOfUniforms	No	slow or fast	moderate	Yes	No	N/A	N/A	No	Yes	No	N/A	bounding rectangle for acceptance region	u v r center verify	u v r center verify	N/A	N/A	N/A	N/A	
Polynomial interpolation based INVersion of CDF	NumericalInversePolynomial	Yes	(very) slow	(very) fast	Yes	Optional	N/A	N/A	Optional	No	No	N/A	N/A	order smoothness u_resolution boundary max_intervals	order smoothness u_resolution boundary max_intervals	usepdf usecdf searchboundary keepcdf	use_upoints	n_intervals approxinvcdf approxcdf estimate_error	n_intervals (property) pdf cdf estimate_uerror	
Simple Ratio-Of-Uniforms method	SimpleRatioOfUniforms	Yes	fast	slow	Yes	No	N/A	N/A	No	Yes	Yes	N/A	T-Concave PDF	cdfatmode pdfatmode usesqueeze usemirror verify	cdf_at_mode pdf_at_mode use_squeeze use_mirror verify	N/A	N/A	N/A	N/A	
Simple Setup Rejection	SimpleSetupRejection	No	fast	slow	Yes	No	N/A	N/A	No	Yes	Yes	N/A	T-Concave PDF	cdfatmode pdfatmode usesqueeze verify	cdf_at_mode pdf_at_mode use_squeeze verify	N/A	N/A	N/A	N/A	
a TABLe method with piecewise constant hats	TABL	Yes	(very) slow	fast	Yes	No	N/A	N/A	No	Yes	Optional Approx.	N/A	all local extrema	variant cpoints nstp useear arearfraction usedars max_aspratio max_intervals cdfatmode guidefactor boundary verify pedantic	variant cpoints n_stp use_ear area_fraction use_dars max_aspratio max_intervals cdf_at_mode guide_factor boundary verify pedantic	darsfactor	N/A	aspratio hatarea squeezearea n_intervals	aspratio (property) hat_area (property) squeeze_area (property) n_intervals (property)	
Transformed Density Rejection	TransformedDensityRejection	Yes	slow	fast	Yes	Yes	N/A	N/A	No	Optional	No	N/A	T-Concave PDF	c variant usedars cpoints max_aspratio max_intervals cdfatmode usemode guidefactor verify pedantic	c variant use_dars cpoints max_aspratio max_intervals cdf_at_mode use_mode guide_factor verify pedantic	darsfactor	N/A	aspratio hatarea squeezearea invcdfhat	aspratio (property) hat_area (property) squeeze_area (property) pdf_hat	
Universal Transformed Density Rejection	UniversalTransformedDensityRejection	No	moderate	moderate	Yes	No	N/A	N/A	Yes	No	Approx.	N/A	T-Concave PDF	pdfatmode verify	pdf_at_mode verify	cpfactor delta0factor	N/A	N/A	N/A	
Discrete Automatic Rejection Inversion	DiscreteAutomaticRejectionInversion	Yes	moderate	fast	N/A	N/A	Yes	No	No	Yes	N/A	Approx.	T-Concave PMF	squeeze tablesize verify	squeeze table_size verify	cpfactor	N/A	N/A	N/A	
(Discrete) Alias-Urn method	DiscreteAliasUrn	Yes	slow	very fast	N/A	N/A	Optional	Yes	No	No	N/A	No	N/A	urnfactor	urn_factor	N/A	N/A	N/A	N/A	
(Discrete) Guide Table method	DiscreteGuideTable	Yes	slow	very fast	N/A	N/A	Optional	Yes	No	No	N/A	No	N/A	guidefactor variant	guide_factor variant	N/A	N/A	N/A	N/A	
Discrete Simple Ratio-Of-Uniforms method	DiscreteSimpleRatioOfUniforms	No	fast	slow	N/A	N/A	Yes	No	No	Yes	N/A	Yes	T-Concave PMF	cdfatmode verify	cdf_at_mode verify	N/A	N/A	N/A	N/A	
(Discrete) Sequential Search method	DiscreteSequentialSearch	No	fast	very slow	N/A	N/A	Optional	Yes	Optional	No	N/A	Yes	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

General Notes

- Runuran doesn't allow changing the method parameters directly. It has an advanced interface to provide the functionality.
- Runuran allows the user to pass a logpdf or dlogpdf whenever pdf or dpdf is required.
- Runuran has a functional API. Setup happens seperately.
- Runuran has a 'unuran.verify.hat' function to verify the hat created by rejection methods by sampling 100,000 samples and printing the ratio of samples for which the hat failed. In this doc, I have proposed a parameter 'verify' that verifies the hat for each random variate sampled.
- Runuran provides two methods to sample from multivariate distributions. I think one of these methods is a MCMC method and another is a rejection method. There is a chance that we can integrate the rejection method.
- AFAICT, Runuran doesn't provide an interface to the statistical tests in UNURAN
- An interface to the String API has been provided by Runuran