The Litter Power Package
Version 1.7.1

February 4, 2008

- What's New (Version 1.7.1)
  - lp.crabelms and lp.ale: Plug-and-Play replacements for the orphaned scramble and alea objects, both using more efficient algorithms and Litter Power-strength random number generators.
  - lp.pvvv~: Now allows you to specify the "PPC sound" or "Intel sound" (yes, the two processors produced slightly different signals with the same underlying code, and no, it's not the infamous byte-order issue). Also implements the sound produced by the mythical PC415 processor (which some people prefer to either PPC or Intel).
  - lp.pfff~ and lp.phhh~: Also support PPC/Intel/PC415 modes, in analogy to lp.pvvv~. The sound differences between processors are subtler for these objects, but for some applications the ability to guarantee a very specific behavior is important.
  - lp.qvvv~: An alternative to lp.pvvv~ that avoids the PPC/Intel sound issues by performing all calculations in floating-point. The sound is uniform across processors, but subtly different from lp.pvvv~. This also implements a new nn algorithm supporting fractional bit-depths in the output signal.
  - lp.bibi: Implements the Beta Binomial model for generating random integers, distributed with shapes otherwise only possible with the Beta distribution.
- What's New (Version 1.7)
  - Universal Binary support for Intel Macs.
  - MSP Generators: lp.feta~ (the fastest white noise implementation available for MSP), lp.ksks~ (a plucked-string generator that plays in tune—no muss, no fuss), and lp.epoisse~ ("pitched" noise).
  - A very simple to use cross-synthesis object: lp.emeric~
  - The most heavy-duty RNG available for Max: lp.mrmr implements the Mersenne Twister algorithm. Marsaglia's "Mother of Random Number Generators" also implemented (lp.mama).
  - New distributions: lp.swamy (Kumaraswamy distribution, a light-weight alternative to the beta distribution), lp.vilfrie (Pareto distribution, models word frequency, income distributions), lp.zippie (Zipf/zeta distribution).
  - Added 'tell' message to most RNGs to provide access to statistical properties. The properties supported cover min, max, mean, mode, median, standard deviation, skew, kurtosis. Note that some properties

may be mathematically undefined or infinite for certain distributions and certain parameters; in these cases the floating-point values NaN and Inf are returned.

- New objects lp.argus and lp.mrsnorris support more conventional window behavior from Max patchers.
- Fixed cosmetic problem with new style Collectives and Standalones on Mac OS, avoiding rescopy errors.[1]
- Improved seeding and auto-seeding. On older versions, some pairs of adjacent seeds produced near-identical sequences. Now even slight changes in seed value will produce radically different sequences.
- lp.norm now distinguishes between arguments of zero and default arguments (ie, [lp.norm 0 0] no longer uses default unit standard deviation).
- Much faster algorithms for lp.norm and lp.gsss~. Also improved algorithms for lp.coshy. lp.abbie, lp.pfishie, and lp.bernie.
- lp.linnie now supports arbitrary min/max/apex.
- lp.hyppie supports hyperbolic secant as well as hyperbolic cosine distributions.
- lp.chichi now also supports chi, inverse chi, and scale inverse chi distributions.
- Added modulo outlet to lp.logos (modulo has a different sign from remainder if one of the operands is negative).
- lp.ccc and lp.ccc~ streamlined.
- Fixed potential memory leak with seed argument for all continuous RNGs.
- lp.pfff: Corrected bug in argument parsing.
- lp.frrr~: worked around bug in Max/MSP that prevents typecasting ints to floats.
- Fixed incorrect calculations in the tattle message for scampi and scampf.
- Extensively updated help files. Litter Power is moving in the direction of making *.help files the source for complete documentation, rather than directing the user to the reference manual.
- Decreased dependence of Windows objects on QuickTime Media Library (the long term goal is to remove all QTML dependencies).
- Fixed problems under Windows with dynamically generated assistance strings (affected sigma & Co., scampi & Co. and several RNGs).

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[1] Ironically, for all the hoo-ha raised about avoiding resources for compatibility with Mac OS X and Windows, the problem referred to above does not occur with the new mach-o format demanded by Max/MSP 4.6, nor did it occur when using Windows resources. Go figure.

- Split What's New for LBJ into a separate document.

• What's New (Version 1.5)

Windows support. This involved a major rewrite of the code base with the goal of using each host OS as efficiently as possible. All Litter objects are now available on both platforms, and all behave identically.[2] The code update was extensive enough to justify a jump to the "almost-major-new-release" version number 1.5.

In addition:

- Added "running statistics" functionality to lp.stacey: you can track statistics over a "window" of hundreds or thousands of items. Great for following long-term trends in audio input or other data.
- Running CPU Status uses new running statistics function in lp.stacey
- Map mode and non-linear scaling finalized in lp.scampf and lp.scampi, supporting exponential and power (quadratic, cubic, etc.) scaling as well as symmetrical scaling curves.
- All Litter objects respond to a 'vers' message, reporting the current version. Useful for patches that may rely on particular features introduced later than version 1.0 of the object in question.
- All .help patchers updated to use the new 'vers' functionality. A number of corrections and additions have been made to the .help file documentation.
- .help patchers automatically reposition themselves based on the host OS. Each OS uses slightly different coordinate systems for window positioning. Mac users have seen patchers developed on Windows that open on Mac with their title bars underneath the menu bar and Windows users find those Mac-developed patchers shifted further down the application window than expected. Not with Litter!

There are more new functions in the works, but the main focus in this revision has been Windows compatibility, with all objects behaving identically, right down to UI issues like assistance strings, Get Info dialogs, and version information in Finder/Explorer. The only thing missing on Windows are custom icons for Litter objects to distinguish them from other Max externals.

• What's New (Version 1.2)

New utilities: lp.sigma, lp.delta, lp.pi, and lp.logos. All inlets are active, so a change to any value triggers output of the result of the calculation. Sigma and pi will add and multiply up to 256 inlets, delta calculates differences (left minus right, right minus left, and the absolute difference), and logos gives you quotient and modulo (naturally for both ints and floats). Help files should now have

[2] OK, it turned out there was as subtle difference in the behavior of lp.pvvv~ with certain parameters, which has now been addressed in Litter Power 1.7.1.

better word wrapping under OS X, no matter what anti-aliasing settings are chosen.

Beta version of Litter Power for Windows is now available for Litter Pros (some Litter objects not available).

- What's New (Version 1.1.1)

Fully Carbonized objects for Max under OS X!

New objects with chaotic properties: simple population growth model (lp.poppy and lp.poppy~), Lyapunov space (lp.lya), Schuster/Procaccia 1/f signal generator (lp.ccc and lp.ccc~).

The objects lp.nn~ (signal degrading, supporting the mind-boggling notion of fractional bit-resolution) and lp.trrr~ (a noise signal with a linear distribution, a textbook solution for dithering) have been made available in the Starter Pack.

- What's New (Version 1.02)

Gaussian and triangular noise (primarily for dithering), variable-color noise, variable-color and black random number generators. Signal degradation with fractional bit resolution!

- What's New (Version 1.0)

Everything. All objects from the original Litter Package ("Classic Litter") have been re-written as external objects. New random number distributions have been added (I Ching, dice, finite urn model, log-normal, parametric linear congruence, Tausworthe 88 and TT800 generators). Improved implementations of fractal noise generators. And:

- MSP objects for generating noise (pink, brown, gray, black, very white, popcorn, PLC, and LF noise)
- Real-time implementations of Interval Mutation algorithms
- Cartesian-to-polar conversion and phase unwrapping (compatible with both MSP 1.x and MSP 2).
- Statistics object now calculates skew and kurtosis (as well as count, min/max, mean and standard deviation).
- Mapping objects (scale, offset, and limit; all in one convenient package)
- I Ching mapping and I Ching texts
- Multiple improvements to existing random number generators

- License Overview

Litter is divided into a freeware Starter Pack and a commercial Professional Bundle. The Pro Bundle includes the right to sell programs created in Max using Litter objects, something that was not permitted under the original freeware Litter license.