Randomary Numbers

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In this paper I present the algebraic rules of real random numbers in the unit interval.

A real random number in the unit interval is generated by a function:

random() : real

For brevity, values generated by this function is annotated `$\mathbf{r}$`, often with one or more index `i` or `j`.

One can then construct an algebra:

$a + b\mathbf{r_i}$: rnd   A randomary number of source `i`

With the following rules:

$$\mathbf{r_{ij}} = (\mathbf{r_i} + \mathbf{r_j}) / 2 \qquad \mathbf{r_{i\text{-}j}} = \mathbf{r_i} - \mathbf{r_j} \qquad \mathbf{r^{ij}} = \mathbf{r^i} \cdot \mathbf{r^j}$$

$$a\mathbf{r_i} + b\mathbf{r_j} = (a + b)\mathbf{r_{ij}} \qquad \mathbf{r_{i\text{-}j}} = 2\mathbf{r_{ij}} - 1 \qquad 1 - \mathbf{r_i} <=> \mathbf{r_i}$$

The indices commute everywhere.