Examples of Markov chains from Hopf algebras (in the sense of [Pan15a]). This version: January 8,
If you spot an error, or know of any other Markov chains built in a similar way, please let me know.

Markov chain	Hopf algebra / Hopf monoid	algebra is...	
		commutative?	cocommutative
shuffling	shuffle algebra $\mathscr{S}$	x	
inverse-shuffling	free associative algebra $\mathscr{S}^*$		x
edge-removal	$\bar{\mathscr{G}}$	x	x
edge-removal	$\mathscr{G}$		x
restriction-then-induction	representations of symmetric groups	x	x
rock-breaking	symmetric functions (partitions)$\subseteq \bar{\mathscr{G}}$	x	x
tree-pruning	Connes-Kreimer	x	
descent-set-under-shuffling	quasisymmetric functions	x	
jeu-de-taquin	Poirier-Reutenauer **FSym**		
shuffle with standardisation	Malvenuto-Reutenauer **FQSym**		

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[Pan15a] C. Y. A. Pang. Card-shuffling via convolutions of projections on combinatorial Hopf algebras. In *27th Internation*
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2016. Curated by Amy Pang. Printer-friendly version, plus related summary tables, available at my website.

			basis	basis is...					$\lvert\mathscr{B}_1\rvert$	pro
e?	free?	cofree?		free-commutative?	free?	cofree?	self-dual?	multigraded?		
		x	words / decks of cards			x		x	arbitrary	shu
	x		words / decks of cards		x			x	arbitrary	co
			unlabelled graphs	x					1	dis
	x		labelled graphs		x				1	dis
		x	irreducible representations				x		1	ext
		x	elementary or complete	x					1	dis
			rooted forests	x					1	dis
		x	fundamental (compositions)			x			1	(no
	x		standard Young tableaux						1	B2
	x	x	fundamental (permutations)						1	shi

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oduct	coproduct	rescaling	stationary distribution	refere
uffle	deconcatenation	none	uniform	[Pan
ncatenation	deshuffle	none	uniform	[DPR
sjoint union	induced on subsets	none	absorbing at empty graph	[DPR
sjoint union	induced on subsets	none	absorbing at empty graph	[DPR
ternal induction	sum of restrictions	dimension	plancherel	[Pan
sjoint union	$\Delta((n)) = \sum(i) \otimes (n-i)$	$\frac{n!}{\prod \lambda_i!}$	absorbing at $(1,1,\ldots,1)$	[DPR
sjoint union	cut branches $\otimes$ trunks	$\frac{n!}{\prod \mathrm{desc}(v)}$	absorbing at disconnected forest	[Pan
on-explicit - use Projection Theorem)		none	proportion of permutations with this descent set	[Pan
2R: add outer box	B2R: unbump	dimension of shape	proportion of standard tableaux with this shape	[Pan
ifted shuffle	deconcatenate and standardise	none	uniform	[Pan

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ences
14, Sec. 6.1]
R14, Sec. 6] [Pan14, Ex. 4.6.2, Ex. 4.7.2]
R14, Ex. 3.1] [Pan14, Sec. 5.1]
R14, Ex. 3.2]
14, Ex. 4.1.4, Ex. 4.3.2, Ex. 4.4.3, Ex. 4.5.3, Ex. 4.6.4] [Pan15a, Ex. 3.5] [Pan15b, Sec. 2]
R14, Sec. 4] [Pan14, Sec. 5.2]
14, Sec. 5.3] [Pan15a, Ex. 5.3]
13][Pan14, Sec. 6.2]
15b, Sec. 4]
15b, Sec. 5]