Examples of Markov chains from Hopf algebras (in the sense of [Pan15]). This version: April 9, 201
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	

[DPR14] P. Diaconis, C. Y. A. Pang, and A. Ram. Hopf algebras and Markov chains: two examples and a theory. *J. Algebra*
[Pan13] C. Y. A. Pang. A Hopf-power Markov chain on compositions. In *25th International Conference on Formal Power*
[Pan14] C. Y. A. Pang. Hopf algebras and Markov chains. *ArXiv e-prints*, December 2014. A revised thesis.
[Pan15] C. Y. A. Pang. Card-shuffling via convolutions of projections on combinatorial Hopf algebras. In *27th Internation*

5. Curated by Amy Pang. Printer-friendly version, plus related summary tables, available at my website.

			basis	basis is...					$\lvert\mathscr{B}_1\rvert$	pro
?	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	con
			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

REFER

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r Series and Algebraic Combinatorics (FPSAC 2013), Discrete Math. Theor. Comput. Sci. Proc., AS, pages 499–510. Assoc. Discrete Math. Theor. Comp

al Conference on Formal Power Series and Algebraic Combinatorics (FPSAC 2015), Discrete Math. Theor. Comput. Sci. Proc., ??, pages ??–?? Assoc. D

oduct	coproduct	rescaling	stationary distribution	references
uffle	deconcatenation	none	uniform	[Pan14, Sec. 6.1]
ncatenation	deshuffle	none	uniform	[DPR14, Sec. 6] [Pan1
joint union	induced on subsets	none	absorbing at empty graph	[DPR14, Ex. 3.1] [Pan
joint union	induced on subsets	none	absorbing at empty graph	[DPR14, Ex. 3.2]
ernal induction	sum of restrictions	dimension	plancherel	[Pan14, Ex. 4.1.4, Ex.
joint union	$\Delta((n)) = \sum(i) \otimes (n-i)$	$\frac{n!}{\prod \lambda_i!}$	absorbing at $(1,1,\dots,1)$	[DPR14, Sec. 4] [Pan1
joint union	cut branches $\otimes$ trunks	$\frac{n!}{\prod \mathrm{desc}(v)}$	absorbing at disconnected forest	[Pan14, Sec. 5.3] [Pan1
on-explicit - use Projection Theorem)		none	proportion of permutations with this descent set	[Pan13][Pan14, Sec. 6.

ENCES

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Discrete Math. Theor. Comput. Sci., Nancy, 2015. available on Arxiv.

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4, Ex. 4.6.2, Ex. 4.7.2]
14, Sec. 5.1]
4.3.2, Ex. 4.4.3, Ex. 4.5.3, Ex. 4.6.4] [Pan15, Ex. 3.5]
4, Sec. 5.2]
15, Ex. 5.3]
2]