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Quarterly (March, June, September, December) 160pp. per issue 6 3/4 x 10 Founded: 1974 2018 Impact Factor: 1.319 2018 Google Scholar h5-index: 32 ISSN: 0891-2017 E-ISSN: 1530-9312

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Concrete Models and Empirical Evaluations for the Categorical Compositional Distributional Model of Meaning

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Posted Online April 14, 2015 https://doi.org/10.1162/COLI a_00209

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Computational Linguistics Volume 41 | Issue 1 | March 2015 p.71-118

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Modeling compositional meaning for sentences using empirical distributional methods has been

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a challenge for computational linguists. The categorical model of Clark, Coecke, and Sadrzadeh (2008) and Coecke, Sadrzadeh, and Clark (2010) provides a solution by unifying a categorial grammar and a distributional model of meaning. It takes into account syntactic relations during semantic vector composition operations. But the setting is abstract. It has not been evaluated on empirical data and applied to any language tasks. We generate concrete models for this setting by developing algorithms to construct tensors and linear maps and instantiate the abstract parameters using empirical data. We then evaluate our concrete models against several experiments, both existing and new, based on measuring how well models align with human judgments in a paraphrase detection task. Our results show the implementation of this general abstract framework to perform on par with or outperform other leading models in these experiments.¹

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