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**JULIA KNIGHT**, University of Notre Dame

*Coding one structure in another*

There are familiar examples in which a structure  $\mathcal{A}$  is coded in a structure  $\mathcal{B}$ . In some of these examples the decoding is effective. Harrison-Trainor, Melnikov, R. Miller, and Montalban defined a notion of effective interpretation. In their definition, the tuples from  $\mathcal{B}$  that represent elements of  $\mathcal{A}$  do not have a fixed arity, and the formulas that define the interpretation are computable infinitary  $\Sigma_1$ . Harrison-Trainor et al. showed that there is an effective interpretation of  $\mathcal{A}$  in  $\mathcal{B}$  iff there are Turing operators  $\Phi$  taking copies of  $\mathcal{B}$  to copies of  $\mathcal{A}$  and  $\Psi$  taking isomorphisms between copies of  $\mathcal{B}$  to isomorphisms between the corresponding copies of  $\mathcal{A}$ . We consider several examples, with the goal of testing whether the notion of effective interpretation captures the idea of effective decoding.