▸ ARIEL GRUNFELD, *Monadic realizability for intuitionistic higher-order logic.*
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The standard construction for realizability semantics of intuitionistic higher-order logic is based on partial combinatory algebras as an abstract computation model with a single computational effect - non-termination. Recent work [1] demonstrated how generalizing the model can affect the validity of formulas in the language, and suggested the general framework of evidenced frames [2] for constructing realizability models, using stateful and non-deterministic computation as examples. As first discussed in [3], many computational effects can be modeled using monads, where programs are interpreted as morphisms in the corresponding Kleisli category. To account for a more general notion of computational effects, we construct an evidenced frame where the underlying computational model is defined in terms of an arbitrary monad, generalizing partial combinatory algebras to combinatory algebras over a monad, and using monotonic post-modules to relate predicates to computations.

[1] Cohen, Liron and Faro, Sofia Abreu and Tate, Ross, *The effects of effects on constructivism*, ***Electronic Notes in Theoretical Computer Science***, vol. 347 (2019), pp. 87–120.

[2] Cohen, Liron and Miquey, Étienne and Tate, Ross, *Evidenced frames: A unifying framework broadening realizability models*, ***36th Annual ACM/IEEE Symposium on Logic in Computer Science (LICS)*** (Rome, Italy), 2021, pp. 1–13.

[3] Moggi, Eugenio, *Notions of computation and monads*, ***Information and computation***, vol. 93 (1991), no. 1, pp. 55–92.