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Higher-order message passing concurrency and copowers in actegories

The Categorical Message Passing Language (CaMPL), is a concurrent language whose semantics lies in a linear actegory. A desirable feature of CaMPL is the support of higher-order processes: that is processes which can be passed between processes as first-class citizens. While this ability is already present in any closed linear type system – such as CaMPL's – to support arbitrary recursive process definitions requires the ability to reuse or copy passed processes. Concurrent resources in CaMPL, however, cannot be duplicated, thus, passing processes as linear closures does not provide the required flexibility. This means processes must be passed as sequential data and the concurrent side must be enriched in the sequential side, motivating the technical result of this talk.