

Eberhart, Clovis; Hirschowitz, Tom

Fibred pseudo double categories for game semantics. (English) Zbl 1412.18006

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From a standard viewpoint, a game is a collection of moves, and players are no other than sequences of moves. In this work, there is a rather elaborate notion of position, which is, intuitively speaking, a hypergraph whose nodes model players and whose edges model communication channels. Moves are higher-dimensional edges, so that plays are some kind of higher-dimensional hypergraphs. The complex nature of plays motivated the second author to axiomatize what is needed for them to yield sensible game models, resulting in the notion of *playground* [*T. Hirschowitz*, Log. Methods Comput. Sci. 10, No. 4, Paper No. 2, 80 p. (2014; [Zbl 1310.68150](#)); Lect. Notes Comput. Sci. 8089, 175–190 (2013; [Zbl 1310.68149](#))], which are pseudo double categories with lots of additional structure and properties. In order to organize plays over a given position X into categories $\mathbb{E}(X)$, without looking into, e.g., innocence, only a certain fiberedness property is needed. The principal objective in this paper is to construct a pseudo double category $\mathbb{D}(S)$ from any signature S (defined in §3). §4 establishes that, under suitable hypotheses on S , $\mathbb{D}(S)$ is fibered (Theorem 4.3.14 and Theorem 4.4.20).

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03B70 Logic of programming

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