Differential λ-calculus and analytic functors

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In their seminal paper [1], Ehrhard and Regnier introduced the differential λ-calculus, an extension of the λ-calculus with a differential operator. This led to several significant developments, including the possibility of approximating λ-terms by a form of the Taylor series expansion [2].

The talk will present a model of the typed differential λ-calculus, built around a generalisation of Joyal's analytic functors, which are a functorial counterpart of exponential power series. The core of this model is the cartesian closed 2-category introduced in [3] and studied further in [4], which can be understood as a 'categorified' version of the well-known relational model of Linear Logic.

The material is based on collaborative work with M. Fiore, M. Hyland, A. Joyal and G. Winskel.

References

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