Differential Turing Categories

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Abstract. Turing categories [Cockett and Hofstra 2008] provide an abstract setting for studying sequential computation and partial recursive functions. Turing categories correspond closely to partial combinatory algebras (PCAs). Work on the differential lambda calculus [Erhard and Regnier 2003] and the simply typed resource calculus [Bucciarelli et. al. 2010] suggests that differential structure may be related to the semantics of distributed computation. These calculi maybe interpreted in Cartesian differential categories [Blute et. al. 2008] and Cartesian closed differential categories.

Differential restriction categories combine differential structure with partiality. In this talk we define the notion of a differential Turing category, and investigage how Turing structure and differential structure should interact. In particular, we will investigate the relationship between differential partial combinatory algebras (DCPAs) and differential Turing categories.

References

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