

Post-doctoral position: ANR project Frontiers of RECOgnizability (FREC)

Subject: Recognizability, Lambda-calculus, Higher-order languages

Some generalizations of context-free grammars (resp. pushdown automata) were proposed in the seventies by Aho (1968,1969). Later on, Maslov (1974,1976) defined the infinite hierarchy of “Higher-order pushdown automata” which extends further the above notions.

The hierarchy of OI languages, defined by means of “higher-order grammars”, based on lambda-calculus was introduced by Damm (1982). This hierarchy turned out to be strongly linked with the one defined by higher-order p.d.a. (Damma and Goerdt, 1986).

As the study of OI languages and their decidable properties require to express strong invariants about higher-order pushdown automata, it may be interesting to use the grammatical presentation of higher-order OI languages by means of lambda-terms and try to express these invariants on the lambda-terms directly. Indeed, doing so one can benefit from the good understanding of the models of simply typed lambda-calculus so as to express the invariants in a more elegant and powerful way.

Thus, the subject of this postdoc pertains to bridging the world of higher-order pushdown automata with that of lambda-calculus. This bridging can be done with several applications in mind. A first kind of application could be the generalisation of the result of decidability of the equality of deterministic context-free languages to certain higher-order grammars. It could also be the study of equations in the lambda-calculus *etc. . .*

Background: The candidate should have a strong background in theoretical computer science. In particular he/she should have knowledge in formal language theory, automata and lambda-calculus.

Founding: The post-doctoral position will be paid around 2090 euros, free of charges, per month.

Application procedure: The applicants should send:

- 1- a Curriculum Vitae
- 2- title and summary of the PHD
- 3- list of publications
- 4- official reports on PHD (preferably in French or English or German),

5- recommandation letters are welcome.

Any particular situation (PHD not yet defended, starting date too early , etc ...) should be clearly explained by a joint letter.

The applications should be sent, by email, to S.Salvati (salvati@labri.fr) and G.Sénizergues (ges@labri.fr) before July 17th of 2011. A decision will be notified on July 23th of 2011.

Dates: The Post Doctoral position would take place Sept. 1st 2011 - Aug. 31st 2012 (not strict).

Contact: S. Salvati, G. Sénizergues.

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