

Master Thesis

**Using gadget construction
in structural convergence**

by Tomáš Hons

Since the Thesis is rather technical, I can report on the topic only roughly. The objects, here called *structures*, whose convergence is studied in the Thesis, are relational objects of a type obtained from a finite language λ taking the arities $\text{ar}(S)$ associated with the individual symbols S of λ .

A *gadget* is a structure \mathbf{G} over the given language extended by an extra R with the arity $n = \text{ar}(R)$ with a specified tuple of points z_1, \dots, z_n , and the *gadget construction* glues copies of \mathbf{G} by the z_i into x_i 's of the n -ary edges (x_1, \dots, x_n) of a structure \mathbf{A} , resulting in a structure $\mathbf{A} * \mathbf{G}$.

In the *structural convergence* introduced by Nešetřil and Ossona de Mendez one studies the sequences of structures \mathbf{A}_n in view of the convergences of $\langle \phi, \mathbf{A}_n \rangle$ of probabilities of the validity of inferences $\mathbf{A} \models \phi(a)$ for formulas in p free variables.

The author studies several aspects of the convergence of the sequences resulting from the gadget construction. It is a high quality Thesis, in my opinion going far beyond of what is expected from a Master one (it is testified, a.o., also by the fact that some of the results have been already accepted for publication). The results are interesting and rather non-trivial, and promise further development of the theory. They prove the Author's ability to use complicated techniques, and a considerable talent for creative research.

Also, the Thesis is very well written and its formal quality is excellent. **I recommend it to be accepted and classified by the degree**

1

August 2023

Aleš Pultr