

Logical frameworks, reverse mathematics, and formal proofs translation

Gilles Dowek ¹

¹ Inria and École normale supérieure de Paris-Saclay

Logical systems such as Geometry, Set theory, Simple type theory, or the Calculus of constructions, can either be defined as autonomous systems or as theories expressed in a logical framework, such as predicate logic. The latter definition allows to decompose them into a number of ingredients (for instance: axioms) and to analyze which proof uses which ingredient. This is the basis of the design of algorithms translating formal proofs from one theory to another and to interoperability between computerized proof processing systems based on different theories.

But to do so, we need new logical frameworks, allowing bound variables, explicit proof-terms, computation rules, and peaceful co-existence of constructive and non constructive proofs.