

# Optimization in Dynamic Language Runtimes

David Sabela (xsabel01) & Antonín Neuzil (xneuzi05)

Dynamic type checking is performed at runtime. Dynamically typed languages don't require specification of data types of variables and can, therefore, refer to a value of any type. The flexibility of dynamic languages is prone to more frequent runtime errors and complex detection. Between dynamic languages belongs, for example, JavaScript, PHP, Python, Ruby, Smalltalk, etc., which are mainly used for web development.

Dynamic languages require high level of adaptiveness at runtime. The lack of type information during the compilation process doesn't allow too much optimization possibilities. In the presentation, we will focus on two optimizations. The first optimization is performed at runtime. It is based on the idea that the dynamic type of reference barely changes at runtime. The second optimization aims at improving the performance of dynamic variables holding different types in the same scope.